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ABSTRACT

A prospective, longitudinal investigation was made of psychological aspects of pregnancy, birth, and the first year postpartum. The majority of participants were Caucasian (90 percent) and Chinese-Canadian (5 percent) men and women and their infant children. Adult participants completed a series of psychological and attitude measures selected to evaluate personality characteristics, attitudes, anxiety, depression, self-esteem, marital and social adjustment, and life events. Assessment of infants included measures taken in the hospital on the Brazelton Neonatal Assessment, maternal assessment of infant temperament at 6 months, assessment of cognitive and motor development at 12 months, and a laboratory analogue of mother/infant attachment at 12 months. Findings indicated that method of birth was unrelated to maternal adjustment, maternal feelings, or mother/infant attachment. Women exhibiting high levels of either anxiety or depression during pregnancy, in the hospital, and during the postpartum period were found to differ significantly from those exhibiting low levels. Responses to psychological measures taken in the hospital demonstrated the emotional lability of women in the immediate postpartum period. No significant differences were found in infant development and attachment when infants of high- and low-anxious depressed mothers were compared. The psychological functioning of fathers was quite similar to that of their partners. It was concluded that anxiety and depressive affect during pregnancy and following birth is maladaptive and that psychological intervention should be incorporated into health care for pregnant women. (Scale items and tables of data are appended.) (RH)

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PROJECT PREPARE

THE ANTECEDENTS AND CONSEQUENCES OF MATERNAL ADAPTATION IN THE POSTPARTUM PERIOD

Christine F. Bradley, Ph.D.
University of British Columbia

MARCH, 1983

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ABSTRACT

This study was a prospective, longitudinal investigation into the psychological aspects of pregnancy, birth and the first year postpartum. The sample consisted of 267 primiparous women and their partners.

Two issues were of special interest: first, the relationship between psychological functioning of the mother, method of birth, maternal feelings and infant development: second, the relationship between maternal psychological functioning and infant development at one year.

The majority of participants in this study were Caucasian (90%) and Chinese-Canadian (5%). The mean age of the women was 28 years and of the men 30 years; 96% were married or living with their partner, and had done so for a period of 4 years.

The participants completed a series of psychological and attitude measures throughout the study (at 20 and 35 weeks gestation, in hospital, at one week postdischarge, and at 1, 3, 6, and 12 months postpartum). The measures utilized were selected to evaluate several dimensions of psychological functioning; personality characteristics; attitudes; anxiety; depression; self-esteem; marital and social adjustment; and life events. In addition, information relating to the birth was obtained from medical records.

Assessment of the infants included the Brazelton Neonatal Assessment in hospital; maternal assessment of infant temperament at six months; an assessment of their cognitive and motor development at 12 months; and a laboratory analogue of maternal infant attachment at 12 months.

The first major statistical comparison was made to ascertain whether method of birth (spontaneous vaginal, N=109; forceps, N=100; or a cesarean birth, N=40) was related to maternal psychological functioning and to infant development. Analyses of variance for three groups, followed by multiple comparisons, demonstrated that for this sample of women method of birth was unrelated to maternal adjustment, maternal feelings or maternal-infant attachment. No significant differences in emotional sequellae were found among women who had different methods of birth. Women who had a cesarean or forceps birth were less positive about their birth experience but there was no indication of psychological risk in the postpartum. Moreover, how women felt regarding their birth and experience in hospital was unrelated to how they felt about their baby. These findings are important from the perspective of those women who need to have a cesarean birth and who are concerned about their relationship with the baby.

The second major finding was that this sample of women and men was not clinically depressed or anxious. However, multivariate analyses conducted on the set of variables at each time period indicated a significant difference between those individuals scoring at or above the 75th percentile on the measures of anxiety and depression compared with those who scored at or below the 25th percentile.

During pregnancy women in the high anxious and depressed groups: felt less pleasure, felt less excitement, were more stressed; reported less positive social and marital adjustment; reported a higher number of negative life events; and had more concerns regarding their pregnancy and the impending birth. A greater number of the anxious and depressed women rated their physical and mental health as poor; and had inappropriate variations in weight during pregnancy.

There were no significant differences among the high/low anxious and depressed groups on the obstetric variables: length of gestation, length of labour (vaginal births only), number of days in hospital of mother and baby, birthweight of the baby, and Apgar at one and at five minutes. There was no signifcant relationship between psychological functioning in the prenatal period and anesthesia, induction, fetal monitoring, method of birth, or complications during birth

While in hospital, women in the high anxious and depressed groups felt significantly less pleasure, less excitement, and more stress. They were significantly more dissatisfied with their hospital experience, their labour and birth, and their preparation for the mothering role. In addition, women in the high anxious and depressed groups more often rated their labour as difficult. Both groups reported that they took longer to feel close to their baby, and had less confidence in caring for the infant.

Essentially, the same results were seen at follow-up points in the postpartum period. At one month fewer women who were in the high depressed groups were breastfeeding only. Women who were more anxious and/or depressed felt significantly less positive about the lifestyle changes since the birth of their baby; felt less confidence in caring for the baby at one month; reported more negative life events; lower levels of self-esteem;

and less positive marital and social adjustment.

Levels of anxiety, depression, mood and self-esteem were compared across time using analysis of variance for repeated measures. Generally, the prenatal level of psychological functioning was quite comparable to the postpartum, with the exception of the hospital period. The responses to psychological measures in hospital demonstrated the emotional lability of women in the immediate postpartum (depression, excitement, arousal, lack of dominance). Once the women had returned home, however, their level of psychological functioning was essentially the same as the prenatal level of functioning.

There were no significant differences in the infant measures of cognitive and motor development or maternal-infant attachment among the infants of women in the high anxious and depressd groups when compared to the infants of women in the corresponding low groups.

The psychological functioning of the men was quite similar to that of their partners, men high on anxiety and depression had less confidence in caring for their baby; more negative attitudes towards lifestyle changes since the birth of their baby; and lower scores on their marital adjustment.

The present research indicates that anxiety and depressive affect during pregnancy and following birth is maladaptive and that psychological intervention should be incorporated into the health care practices of pregnant women. The childbearing year is a critical intervention point in terms of prevention and promotion of psychological health and wellbeing for the family.

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CHAPTER I

THE ANTECEDENTS AND CONSEQUENCES OF MATERNAL ADAPTATION IN THE POSTPARTUM PERIOD

Introduction

A review of medical, psychological and nursing literature relating to pregnancy and childbirth, reveals a lack of empirical studies, data and theoretical propositions that would guide those doing research in this area. The normal experience of childbearing has rarely been seen as a legitimate research area in either medical or social fields (Leifer, 1980; Oakley, 1980). Similarly, psychologists have ignored pregnancy and childbirth, normal or abnormal, as a viable area for research - although this is changing, as evidenced by the two recent longitudinal studies (Leifer, 1980; Grossman, Eichler, & Winickoff, 1980) and a review of the psychological aspects of human reproduction (Selby, Calhoun, Vogel, & King, 1980).

Over a decade ago, it was stated that there was an "almost total lack of systematic attention to the psychology of normal pregnancy" (Horsley, 1972, p.292). Other more recent reviews reflected this position (Chalmers, 1982; Leifer, 1980; Oakley, 1980; Selby et al., 1980). Selby and associates stated that pregnancy, labour and birth have attracted "little systematic attention from behaviour scientists" (p. ix). Despite this lack of empirical data, pregnancy, childbirth and the postpartum has been frequently portrayed as a time of crises, poor psychological health depression and anxiety (Celotta, 1982).

The notion has been promulgated in the scientific and popular literature that a stressful birth interferes with the relationship between a mother and her baby in the immediate postpartum. The popular dissemination of such conjectures without the support of relevant data, made it imperative that the childbearing experience of normal, low risk women be evaluated more systematically.

Psychological Functioning

The major emphasis in past research has been on the psychopathological conditions of women during pregnancy and childbirth, e.g. puerperal disorders, relationships between abnormal emotional and psychological factors during the course of pregnancy and obstetric outcome.

Empirical work concerning the relationship between reproductive and psychological functions has appeared in the obstetric and gynecological literatures. Theoretical approaches to the relationship of psychological and reproductive functions have been written primarily from a Freudian or psychoanalytic framework (Benedek, 1973; Bibring, 1959, 1961; Deutsch, 1973; Kestenberg, 1978; Turrini, 1980). These works are vulnerable, however, to such criticisms as unproven theoretical assumptions, lack of sound methodology, lack of empirical data, and use of clinical case histories (Bradley, 1977).

Some of these studies have investigated the relationship between psychological functioning, primarily anxiety, and obstetric outcome. Other studies have focussed on depression in the postpartum period. It has even been suggested that anxiety may be characteristic of pregnancy, and depression characteristic of the postpartum period (Meares, Grimwade, Bickley & Wood, 1972).

Anxiety. Several reviews of the relationship of anxiety to obstetric outcome have been published recently (Carlson & Labarba, 1979; Chalmers, 1982; Reading, in press). However, the conclusions of the authors are contradictory. For example, Carlson and associates (1979) stated that evidence from better designed studies generally support the notion of a relationship between maternal emotionality and reproductive outcome. Chalmers (1982), however, concluded that the research designs used to examine the role of psychological factors in developmental outcomes are "fraught with problems" and that "From the variety of methodological problems encountered, it is apparent that some of the traditionally utilized approaches to research in the field of pregnancy are open to question and interpretation" (p.329). Chalmers also stated "It is evident from the contradictions in the literature, however, that the roles of life event stress, anxiety and psychological support systems....have yet to be fully understood" (p.325).

Depression. The second condition most often associated with childbirth is postpartum depression. Although a great deal has been written about postpartum depression, Herzog and Detre (1976) pointed out that psychiatric disorders associated with childbirth are controversial both in definition and etiology (p. 229). The prevailing diversity of approaches to the topic of postpartum depression reflect some of the basic problems with the conceptualization of depression in general (Rehm, 1981). According to Rehm (1976), "There is little agreement in the psychiatric and psychological literature as to what constitute the phenomena of depression" (p. 233).

The point has also been made that there is no satisfactory class scheme for the emotional and psychiatric disorders of pregnancy. Cohen (1979) stated that one of the reasons for this is the controversy over the issue of whether pregnancy is to be treated as an illness, or a normal developmental process.

Maternal-Infant Relationship

There are indications in the literature that the presence of anxiety and/or depression in the childbearing women may have implications for the health of the mother and also the health of the infant.

After a review of over 150 studies, Bronfenbrenner (1975) concluded that "in the early years of life, the psychological development of the child is enhanced through his development in progressively more complex enduring patterns of reciprocal contingent interaction with persons with whom he has established a mutual and enduring emotional attachment" (p. 554). His survey of the research indicated that the infant's dependency on the mother develops gradually during the first year "reaches a maximum in the second year, and then decreases as the child forms new attachments and interests" (p. 555).

Developmental psychologists who have investigated maternal-infant interaction have indicated that stimulating, responsive maternal behaviour influences the child's intellectual development (Clarke-Stewart, 1973). The central finding of Clarke-Stewart's study was that the competency of children in the language, cognitive and social areas was related to maternal care. She stated that "Cognitive development was not related to the stimulation inherent in the physical environment per se, a finding which demonstrates the importance of the mother as a mediator of the physical environment" (p. 93). Other researchers (Beckwith, Cohen, Kopp, Parmelee and Marcy, 1976) found that preterm infants who differed in their level of cognitive and sensorimotor development also differed in their patterns of social transactions with their primary caretakers. Sroufe and Waters (1976) maintained that the cognitive and social-emotional aspects of development are inseparable; that the role of the attachment relationship and interaction with a sensitive, responsive caregiver serve to promote the developing cognitive abilities of the infant. Other researchers have suggested that the social development of the infant is related to the quality of the affect of the mother or primary caretaker (Cohn & Tronick, 1983).

If, as these researchers maintain, cognitive and social-emotional aspects of development are inseparable, one might expect the infants of depressed mothers to be at a disadvantage. McLean (1976) pointed out that evidence from self-report studies indicated that parental depression may render parents less capable of effective parenting and that parental depression provides children with the opportunity to acquire ineffective interpersonal coping strategies through parental modelling. Earlier work by Weissman and Paykel (1974) indicate that "an acute depressive episode significantly impaired the woman's capacity as a mother" (p. 223).

Recent research provided support for the above thesis (Cohn & Tronick, 1983). Cohn and associates stated that three months old infants are able to regulate their behaviour in response to the affective display of their mother. They found that when the mothers acted in a depressed manner, their infants responded in turn by attempting to elicit a change in the affect of the mother. Failing to accomplish this, the behaviour of the infant became negative and less well organized. Their data also indicated that the changes in infant behaviour may extend over time. The authors suggested that if depressed maternal behaviour were a regular occurrence "it might produce a chronic pattern of withdrawal and avoidance in the infant that would be seen in all situations the infant confronted" (Cohn & Tronick, 1981, p. 19).

In the longitudinal study of Sameroff and associates (Sameroff, Siefer, & Zax, 1982) it was found that young children were most at risk if their mother was a neurotic depressive; and "The impact of maternal depression remains constant throughout the first years" (p.59). More recent work (Kokes, 1980) has shown that children's incompetence in school was related to symptoms of depression/withdrawal in their mothers regardles of maternal psychiatric diagnosis.

Clinical studies of older children, cited by Weissman and Paykel (1974) indicated that interactions between depressed women and their children differ on several dimensions from the interactions between non-depressed women and their children. The depressed women were more impaired as parents than were the normal group.

Maternal-infant Bonding

Klaus and Kennell, (1970) and others (Cox & Smith, 1982; de Chateau & Wiberg, 1977; Seashore, Leifer, Barnett, Leiderman, 1973) have suggested that what happens in the immediate postpartum period may be crucial for later maternal behaviour, and that incompetent mothering may result from the restriction of maternal/infant interaction immediately after birth. Low birthweight and prematurity often involve a prolonged separation between mother and infant. Kennell, Trause and Klaus (1975) cited studies showing that premature infants constituted a "disproportionately high number of both battered children (23-31%) and those with "failure to thrive syndrome." Helfer (1975) stated that the precipitating event leading to child abuse "...may be real or imagined, a birth defect, a social or economic disruption of the family, a difficult pregnancy or delivery, or early separation of mother and child." According to Helfer, abused children have a prematurity rate twice that of the general population and a cesarean section rate much higher than that of the general population. (In a personal communication to Kennell (1975), Helfer stated that the incidence of child abuse is ten times greater with a cesarean section than with vaginal deliveries.) More recently, Harvey (1978) found evidence of increased neurotic symptoms in the mothers of battered infants. He also found evidence of frequent separation of these mothers and their infants early in the postpartum partum period, and suggested that separating the mother from her infant during the perinatal period may have "deleterious effects."

Subsequent research, however, has not confirmed the association between early contact and maternal-infant bonding (Campbell & Taylor, 1979; Craig, Tyson, Sampson & Lasky, 1982; Egeland & Vaughn, 1981; Farber, Vaughn, & Egeland, 1981; Herbert, Sluckin, & Sluckin, 1982; Hwang, 1981; Lamb, 1982a; Siegel, 1982; Svejda, Campos, & Emde, 1980; Taylor & Hall, 1979). Despite this research to the contrary and despite the fact that Klaus and Kennell have modified their original position, (Klaus & Kennell, 1982), the earlier notions espoused by Klaus and Kennell still enjoy a wide distribution in the popular literature. There continue to be expressions of major concern regarding the effect of early separation of mother and infant, particularly in relation to cesarean birth, in the popular press and in parent handbooks (Donovan, 1978; Meyer, 1981; Wilson & Hovey, 1981).

Studies investigating problems of mother-infant relationships in the perinatal period have usually been conducted to determine factors which may affect the psychological development of the infant. Little systematic attention has been given to the question of maternal adjustment, however, especially with respect to the method of birth and how it relates to psychological adjustment in the postpartum.

Purpose of the Study

The present investigation enhanced current knowledge about the psychological aspects of childbearing by exploring the birth experience of a sample of normal women and their husband/partners. Specific interests included (1) the assessment and identification of psychological states during pregnancy, childbirth, and the postpartum period; (2) relationships between type of birth (whether spontaneous vaginal, forceps or cesarean), maternal psychological functioning, and feelings towards the infant; (3) relationships between a parent's psychological functioning, and the cognitive and social development of the infant at one year.

At the same time, this study afforded the opportunity to investigate several lifestyle variables of interest to health professionals, that is, incidence and duration of breastfeeding; incidence of smoking and use of alcohol.

The impetus for this study was based upon several factors. First, the convergence of opinion in the literature suggested that pregnancy and childbirth be the focus of sustained interdisciplinary research (Bradley, 1977; Bronfenbrenner, 1975; Murphy and Chandler, 1972; Hofer, 1975; Kessler & Albee, 1975). Second, one cannot make meaningful statements regarding abnormality, whether physical or mental, without regard to the normal population (Medwar, 1967). Third, the impetus stemmed from the author's belief in, and commitment to, the importance of the childbearing period as a critical time for the promotion of psychological health and well-being for the family as a whole.

CHAPTER II

METHOD

Participants

A total of 302 women and their husbands/partners indicated interest in participating in a study into the psychological aspects of pregnancy and childbirth.

The criteria for inclusion in the study were as follows:

English speaking
Primiparous
Residing in the City of Vancouver
Attending prenatal classes
Expecting a single infant
Planning to give birth in a Vancouver hospital

Attendance at prenatal classes was a major criterion for eligibility to participate in this study as there is evidence to suggest that women who do not participate in education for childbirth differ from those who do participate (Brewin & Bradley, 1982; Cave, 1978; Cogan, 1980; Felton & Segelman, 1978; Hughey, McElin, & Young, 1978; Huttel, Mitchell, Fisher, & Meyer, 1972; Klusman, 1975; Whitely, 1979; Zax, Sameroff, & Farnum, 1975).

It was felt necessary to control for parity as previous research has demonstrated that primiparae and multiparae do in fact differ in their attitudes towards pregnancy and childbirth (Erickson, 1965; Doty, 1967; Tanzer, 1967; Westbrook, 1978).

Of the 302 women who expressed interest, 12 women were ineligible to participate in the study - ten were not fluent in the English language and two were identified as having problem pregnancies by the Nurse Researcher. The remaining 290 women completed an Initial Interview with the Nurse Researcher, at which time the study and proposed involvement of the participants were more fully described. Of those interviewed, 23 women chose not to participate in the study.

The final sample consisted of women (N=267) and their partners (N=239) who agreed to participate and who met the eligibility criteria for the study.

Preliminary analyses were conducted to ascertain the following: (a) whether those women who remained in the research project differed from those who volunteered but did not participate in the project; (b) whether women whose husband chose not to participate at the beginning of the project were different from those women whose husbands did participate; (c) whether differences existed depending upon which type of prenatal class attended; and (d) whether differences existed depending upon the hospital in which the women gave birth.

Withdrawals from the Research Project

Withdrawals from the study were of two types. First, those who indicated that they were interested in the research project but did not participate beyond the Initial Interview. Second, those who withdrew during the operational phase of the project (Initial Interview until one year postpartum).

Those who withdrew around the time of the Initial Interview (N = 23) were compared with the participants in the project (N = 267) on information that was obtained at the time of the Initial Interview, e.g demographic variables. Analysis of the two groups using t-tests, revealed that there were no significant differences between non-participants and participants in terms of the following demographic variables: age, ethnic origin (mother/father); level of education (mother/father); level of education (mother/father); or occupation (mother/ father). However, a higher proportion of the participants earned more than $30,000 per year, $\underline{X}^2$ (3) = 10.16, $\underline{p} <.017$.

Since those participants (N=24) who withdrew or moved during the course of the project did so at varying times, they were considered as part of the project, and their data counted as missing. Of these 24 women, 10 moved out of the City of Vancouver, 8 withdrew from the project, and 6 were "lost".

Participation by Husband/Partners

The next analyses compared women whose husbands did not agree to participate in the study at the initial contact (N=28), with women whose partners did agree to participate (N=239). Analysis of the data using t-test revealed that there was no significant difference between the two groups of women in terms of their demographic variables. Similarly, there was no significant difference in age, or occupation of the fathers. There was, however, a significant difference between level of education of the fathers. The participating fathers had a significantly lower level of education than the fathers who chose not to participate, $\underline{t}$ (264) = -4.10, $\underline{p} <.001$. Median level of education of the participants was technical or junior college, while the median level of the non-participators was university graduates.

Prenatal Class Comparisons

Women were compared with respect to the type of prenatal class attended. Of the total sample, 159 (60%) women attended classes offered by Community Health, and 108 (40%) attended private education for childbirth classes.

There were no significant differences in age, education, or occupation between the two groups of women. There was a significant relationship between type of prenatal class attended and level of combined income, $\underline{X}^2$ (3) = 20.96, $\underline{p} <.0001$. Women attending private classes had a higher income level. Women in the private classes were married significantly longer, $\underline{t}(263) = 2.64$, $\underline{p} <.009$; reported significantly more social support during pregnancy, $\underline{t}(262) = -3.11$, $\underline{p} <.002$; were less anxious at the Initial Interview, $\underline{t}(260) = -2.01$, $\underline{p} <.045$; and had a higher level of social adjustment, $\underline{t}(260) = -3.01$, $\underline{p} <.003$, than women attending community health classes.

There was no significant difference in psychological functioning (other than anxiety at the Initial Interview), or age, pregravid weight, weight gain, length of gestation, length of labour, method of birth, use of anaesthesia, complications or days in hospital for mother and infant.

Hospital Comparisons

To ascertain whether there were differences in the women who went to each of the three Vancouver hospitals, analyses of variance for three groups was conducted on the demographic and psychological measures obtained during pregnancy. There were no significant differences in the age, education, occupation, or number of years married for either the woman or her partner.

Nor were there differences in depressive affect, anxiety, overall social adjustment, self-esteem or attitude towards pregnancy.

There was no relationship between choice of hospital and subsequent obstetric procedures: induction of labour; the use of fetal monitoring; the type of birth (whether spontaneous vaginal, forceps, cesarean); length of gestation of the mother; birthweight of the baby, or the number of days that the women spent in hospital after the birth.

Sample Characteristics

Demographic. At the Initial Interview, the mean length of gestation was 21 weeks (*SD* = 3.79 weeks). Ninety percent of the women were Caucasian; 5% Chinese-Canadian; 5% other. With respect to their husbands/partners, 91% were Caucasian, 4% Chinese-Canadian and 5% other. The mean age of the women was 28.26 years (*SD* = 4.08 years), ranging from 16 to 41 years. The mean age of the husbands/partners was 30.50 years (*SD* = 4.84), ranging from 17 to 49 years. Ninety-six percent of the women were married or living with their partner, 90% of whom agreed to participate in the study. The mean length of residence in Vancouver was 14.23 years (*SD* = 10.49 years). The women who were married or cohabiting at the initial contact had been living with their partners for a mean of 4.14 years (*SD* = 2.69 years).

The mean length of gestation at the second prenatal contact was 35.56 weeks (*SD* .89).

The occupations of the couple were categorised according to Hollingshead Social Index (1965). The demographic information relating to occupation, education and family income, for the sample is provided in Table 1.

Health during pregnancy. At the Initial Interview, the women rated their physical and mental health during pregnancy on a three point scale. At this time, 70% of the women rated their general health as good to excellent; 25.5% rated it as average; 2% had chronic health problems such as diabetes. With respect to their mental health status, 85% rated their mental health as excellent; 15% had concerns about their mental health and less than 1% were receiving psychiatric help at the time of the study.

The mean pregravid weight of the women was 56.39 kg (124.31 lbs.); SD = 7.39 kg (16.28 lbs.); range 39.01 - 94.80 kg (86-209 lbs.). The total mean weight gain during pregnancy was 15.21 kg (33.52 lbs.); SD = 4.33 kg (9.54 lbs); ranging from 5.54 kg to 27.22 kg (60 lbs.).

Additional prenatal descriptive data revealed that 90% of the women in the study toured the hospital obstetric facilities before the birth of their baby; 69% discussed their plans regarding labour and birth with their physician; 74% were exposed to prior discussions of cesarean section in the prenatal classes, and 96% of the participating husbands/partners were planning to attend the birth. The women attended an average of 7.4 prenatal classes (SD = 2.2), their partners attended an average of 6.8 prenatal classes (SD = 2.6).

Hospitals. Ninety-five percent of the women had their babies in one of the three hospitals within the City of Vancouver.

TABLE 1

Demographic Status of Participants (N = 267) at Initial Interview Compared with Local or Canadian Statistics

Level of Education

Participants	Mother	Father	Local Statistics (1976)*	
Grade 9 or less	.8	.4	26.6	Grade 9 or less
Grade 10 - 12	21.8	18.8	49.1	Grade 10 - 13
Technical College	31.2	19.5	9.9	1 - 2 yrs University
University	37.2	30.1	14.4	3 yrs+ University
Postgraduate	9.0	28.2		

Occupation

Participants	Mother	Father	Local Statistics (1971) **	
Higher executives	4.5	24.3	4.4	Managerial
Business managers	32.6	22.8	6.2	Professional
Administrative	14.2	17.6	8.4	Teaching/Medical
Clerical/sales	33.7	7.9	22.9	Clerical
			11.2	Sales
Skilled	1.1	9.4	16.2	Service
Semi-skilled	2.2	5.6	2.0	Primary
			12.7	Processing
			6.3	Construction
			8.7	Transportation
Homemaker	4.9	n/a	1.0	Other
n/a single parent	3.0		33.6	Female head of household

* Vancouver Local Areas: Statistics Compiled from the 1971 and 1976 Canada Censuses. Vancouver, BC: City Planning Department, April 1979.

** This information is collected once a decade. The 1981 statistics are not yet available. Vancouver Local Areas. Vancouver, BC: City Planning Department, April 1975.

continued ...

TABLE 1

Demographic Status of Participants (N = 267) at Initial Interview Compared with Local or Canadian Statistics

FAMILY INCOME

Participants		Families without children and adults under age 45 *	
$10,000 & under	6.8	4.9	Under $10,000
10,001 - 20,000	17.2	18.3	10,000 - 19,999
20,001 - 30,000	25.2	29.7	20,000 - 29,999
Over $30,000	50.8	47.1	$30,000 & over

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* Family Incomes: Census Families, 1980. Ottawa: Statistics Canada, August 1982. 8-3302-514.

Four percent had babies in hospitals in the Lower Mainland and one percent had a home birth. Sixty-nine percent of the women were attended by family physicians; 31% by obstetricians.

A review of the Medical Records of women in each of the three Vancouver hospitals indicated that 109 women had a spontaneous vaginal birth (spontaneous group); 100 women had a forceps assisted birth (forceps group); 44 women had an unplanned cesarean section (cesarean group); seven women had an elective cesarean section.

Breastfeeding. Upon discharge from the hospital, 95% of the women were breastfeeding their baby; they continued to do so for more than six months (mean 6.75, SD 4.05 months).

Home visits. The mean age of the babies at the home visits was as follows: at the one month visit, 32.6 days (SD = 4.33); at the three month visit, 13.02 weeks (SD = .963); at six months, 25.94 weeks (S.D. = 1.769).

As British Columbia has universal medicare paid by both provincial income tax and premium payments all women were covered for their medical and hospital expenses and had no out-of-pocket expenses relating to the birth.

Procedure

Recruitment

The couples were recruited from community (Vancouver Health Department) and private organisations (Childbearing and Vancouver Childbirth Association) offering education for childbirth classes. Sixty percent of the sample attended prenatal classes offered by Community Health prenatal classes and 40% attended classes offered by private organizations.

In order to recruit the couples for this study, the Nurse Researcher visited education for childbirth classes held between September 1979 and August 1980. The project was briefly described and the requirements for participation outlined. If a woman and her partner indicated that they were interested in the project the Nurse Researcher made a home visit and described the project in greater detail.

Initial Interview

If the woman agreed to participate in the study, an informed consent form was signed in duplicate (see Appendix A). The Nurse Researcher then conducted a semi-structured interview to obtain the necessary demographic, lifestyle, and obstetric information. At the end of the Initial Interview, further explanations were given regarding completion of the requirements for the study. The first two sets of questionnaires (to be completed during the week following the Initial Interview and at 35 weeks gestation) were left to be completed and returned to the project office in the stamped addressed envelope provided.

After completion of the Initial Interview, the woman was assigned a specific Nurse Interviewer to ensure continuity of contact throughout her participation in the study.

35 weeks

Telephone contact was made by the Nurse Interviewer to introduce herself and to remind the participant to complete and mail the 35 week questionnaire package at that time. Arrangements were made by the Nurse Interviewer to be contacted once the baby was born. The Nurse Interviewer in turn notified the office of the birth.

Hospital

The packages of questionnaires to be completed in hospital and at one week post discharge were mailed to the participants one month prior to their expected date of birth. The father telephoned the Nurse Interviewer after the baby was born. A hospital visit was made by the Nurse Interviewer to renew her acquaintance with her "client" and to discuss the labour and birth experience. At this time participants were also reminded to complete the hospital questionnaires. A spot check on completion of questionnares was done by the Nurse Researcher.

The Nurse Researcher examined the newborn infants in hospital using the Brazelton Neonatal Assessment Scale (Brazelton, 1973).

One week After Discharge

When the participant had been home from the hospital for one week, she and her partner completed the set of appropriate questionnaires and returned the hospital and one week set to the office.

One, Three, Six and Twelve Months

All questionnaires were mailed to the participants two weeks before the scheduled home visit in order that they could be completed and handed to the Nurse Interviewer at that time. At the home visit the Nurse Interviewer conducted a semi-structured interview with the women, and weighed and measured the baby.

At each home visit, the Nurse Interviewer obtained information relating to the health of the mother and infant; smoking and alcohol use; type of feeding; problems with feeding; information relating to perceived stress at the time of the visit and questions relating to social support.

After the six month home visit, the Nurse Interviewer rated her clients with respect to their level of "risk" during the first six months postpartum; stated whether the women had been referred to an appropriate professional, and to whom; and stated whether she (the Nurse Interviewer) had intervened, and in what way.

When the baby was one year of age, the home visit included a developmental assessment of the infant. Arrangements were also made at that time for the mother to bring her infant to the University of British Columbia for an assessment of maternal-infant attachment.

Confidentiality

Confidentiality was strictly maintained throughout the study. Each family was assigned a code number and all data were identified by this number. Verbal and written explanations of the study were made initially and throughout the study. Informed consent forms were signed, in duplicate, and the participants were advised that they were free to withdrew from the study at any time should they desire.

All participants were told that, upon conclusion of the study, they would receive a brief report of the major findings.

Communications with physicians

A letter was sent to the physician of each participant informing him/her of their patient's participation in the project and enclosing one of the participant's signed consent forms.

Project Staff

Many individuals were involved throughout the duration of this study, and included the following:

Nurse Researcher, (1) a Community Health Nurse who was trained to administer the Brazelton Neonatal Assessment Scale (Brazelton, 1973) at the School of Nursing, University of Washington, Seattle, WA. The Nurse Researcher resigned prior to the end of the data gathering phase of the research, to give birth herself.

Nurse Interviewers, (11) childbirth educators, ten of whom were Community Health Nurses.

Faculty of Education doctoral students (3) trained to administer the Bayley Scales of Infant Development (Bayley, 1969).

Students majoring in Film (2) at the University of British Columbia, who were responsible for the filming of the Strange Situation video sequences involving the mother and infant.

Measures

The measures used in this study were selected to assess several dimension of maternal functioning. They were chosen from among measures considered relevant in the area of pregnancy and childbirth. The measures included attitudes, psychological functioning (anxiety, depression, self-esteem) personality, and psychosocial (marital and social adjustment). Standardized measures were chosen wherever possible. In the absence of standardized measures, the attitude questionnaires chosen were either developed for this research or other similar populations. In addition, demographic and obstetric information was obtained.

For clarity of presentation, the measures and time schedule for completion are set forth in Table 2.

Measures of Maternal Functioning

Personality. The Personality Research Form (PRF) was designed by Jackson (1974) to yield a set of scores for personality traits relevant to the functioning of individuals in a wide variety of situations. It is focussed upon areas of normal functioning rather than upon psychopathology (p.4).

Depression. Level of depressive affect was measured by the Depression Adjective Checklists (Lubin, 1965). The DACL was developed as a measure of transient or state depressive mood, as part of "an investigation of mood changes during pregnancy and the postpartum period" (Lubin, 1967, p. 7). It has the advantage of being brief and has alternate forms for the purpose of repeated measurement. The cutting score for mild to moderate depression is 70 (T score), and the higher the score the greater the depressive mood.

The Depression Score. This is a four item behaviourally anchored questionnaire. According to McLean and Hakstian (Note 1), it discriminated well between depressed and normal inpatients in a double cross validation

TABLE 2

Schedule for Completion of Data: Time Period and Measures

Package 1 - Initial Interview

Mother	Personality Research Form E
M & F	DACL A
M & F	STAIT
M & F	STAI 1
M & F	MOOD 1
Mother	Social Adjustment 1
M & F	Life Events 1
M & F	Attitude to Pregnancy 1

Package 2 - 35 Weeks

M & F	DACL B
M & F	STAI 2
M & F	MOOD 2
Mother	Self-report Inventory 1
M & F	Dyadic Adjustment 1
Mother	Patient Satisfaction Questionnaire
M & F	Attitude to Pregnancy 2

Package 3 - Hospital

Mother	DACL C, D, E, F, G
Mother	STAI 3
Mother	MOOD 3
Mother	Attitude to Labour & Delivery
Mother	Hospital Questionnaire 1

Package 4 - 1 Week at Home

M & F	DACL 4
M & F	STAI 4
M & F	MOOD 4
M & F	Attitude to Baby 2

Package 5 - 1 Month

M & F	DACL B
M & F	STAI 5
M & F	MOOD 5
Mother	Depression Score 1
M & F	Attitude to Baby 3
Mother	Hospital Questionnaire 2
M & F	Life Events 2
Mother	Self-report Inventory 2

Package 6 - 3 Months

M & F	DACL C
M & F	STAI 6
M & F	MOOD 6
M & F	Attitude to Baby 4
M & F	Dyadic Adjustment 2
Mother	Social Adjustment Scale 2
Mother	Self-report Inventory 3
Mother	Depression Score 2

Package 7 - 6 Months

M & F	DACL D
M & F	STAI 7
M & F	MOOD 7
M & F	Attitude to Baby 5
M & F	Life Events 3
Mother	Self-report Inventory 4
Mother	Depression Score 3
Mother	Social Adjustment Questionnaire 3
Mother	Infant Temperament (Carey)

Package 8 - 12 Months

M & F	DACL E
M & F	STAI 8
M & F	MOOD 8
M & F	Attitude to Baby 6
M & F	Life Events 4
Mother	Social Adjustment 4
Mother	Self-report Inventory 5
M & F	Dyadic Adjustment 3
Mother	Depression Score 4
Mother& Infant	Strange Situation Test
Infant	Bayley Test of Infant Development

study. Reliability and validity figures are currently in preparation. In terms of scoring, the higher the score, the more depressed a person. A cut-off score of 32 has been established to differentiate the depressed person from a non-depressed person.

Beck Depression Inventory. The BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), is a 21 item self-report inventory which was designed to assess emotional, cognitive, motivational and physical symptoms of depression. Evidence supporting the reliability and the content, concurrent and construct validity of this instrument has been demonstrated (Beck, 1967). The items relating to weight on the BDI were omitted for this study. A cut-off score of 13 has been recommended for screening purposes and a score of 21 for clinical research (Beck & Beamesderfer, 1974).

Anxiety. The State Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970) was used to assess levels of anxiety. It is composed of two separate self-report scales for measuring trait (A-trait) and state (A-state) anxiety. State anxiety is an indicator of the level of transitory anxiety, and trait anxiety is an indicator of proneness or an enduring predisposition towards anxiety. The higher the scores obtained on these two measures, the higher the level of anxiety.

Mood. The Mood scales were designed by Mehrabian and Russell (1974) as semantic differential measures of emotional states. The characteristic levels of emotions are described in terms of pleasure, arousal, dominance, stress, and excitement. The range of Alpha coefficients obtained across the time periods assessed in the present study were as follows: pleasure - from .87 to .90; arousal - from .35 to .61; dominance - from .56 to .68; excitement - from .90 to .92; and stress - from .89 to .94. The higher the score, the higher the level of the emotional state in question.

Self-esteem. Low self-esteem has often been associated with depression. Studies have shown that negative self evaluations relate to symptoms of depression (Beck, 1967). Recent research has indicated that levels of depression vary as a function of self-esteem, and that self-esteem is a determinant of depression (Coleman & Miller, 1975; Wilson & Krane, 1980). The measure of self-esteem was developed by Epstein (1976). It is a self-report measure consisting of nine scales including general self-esteem, competence, likeability, and physical appearance. The Alpha coefficients for the nine scales were computed using the present sample data and were found to range from .70 to .87. The higher the score, the higher the level of self-esteem.

Social Adjustment. According to Weissman and Bothwell (1976) social adjustment is broadly defined as the interplay between an individual and his/her social environment. The items on the social adjustment questionnaire which they developed are grouped into role areas encompassing work, social and leisure, extended family, marital, economic, and family unit. Reported inter-rater reliability over all the items is .83. The higher the score obtained on this measure the less socially adjusted an individual.

Life Events. Although most studies of life stress events focus on the relationships between these events and physical illness, work by researchers in the area of life events (Brown, Harris, & Peto, 1973; Grosscup & Lewinsohn, 1980; Paykel, Myers, Dienelt, Klerman, Lindenthal, & Pepper, 1969) has shown that life events, particularly undesirable, unpleasant, or negative life events are related to depression. Negative life events have been shown to relate more strongly to personal distress than to events reflecting life change in general (Vinokur & Selzer, 1975). Other researchers have found that social factors are also reflected in depression, e.g. reduced social support and poor marital relationships (Ballinger, Buckley, Naylor, & Stansfield, 1979; Kumar & Robson, 1978a; Todd, 1964). The Life Events List used in the present study is based on that of Coates and his associates (Coates, Moyer, Kendall, & Howat, 1976).

Dyadic Adjustment Scale. The Dyadic Adjustment Scale (Spanier, 1976) is a 32 item self-report inventory containing four empirically validated subscales of marital adjustment: - dyadic consensus, dyadic cohesion, dyadic satisfaction and affectional expression. High internal consistency and reliability has been demonstrated for these four subscales as well as the complete scale. Evidence supporting content, criterion related and construct validity for this scale has also been reported by Spanier and Cole (1976). Jacobson and Anderson (1980) have suggested that a cut off score for maritally distressed couples should approximate one standard deviation below the mean of the sample.

Attitude Questionnaires. The questionnaires dealing with attitudes and feelings of the women and men towards pregnancy, labour and towards the baby at different time points were developed by Bradley (1977) based on the work of Schaefer and Manheimer (Note 2) and Jordan (1973). Internal consistency indices (coefficient alpha; Nunnally, 1978) for these questionnaires are all above .80 indicating that they have adequate internal consistency. These questionnaires have been shown to have satisfactory internal consistency and to relate negatively to standardized measures of anxiety and depression in two previous studies of a similar sample of women (Bradley, 1977; Bradley, Ross & Warnyca, Note 3). See Appendix B for the reliability coefficients.

The above questionnaires have been revised and refined for this study. The process of revision has shown that there are two subscales: A subscale assessing confidence in caregiving, and a subscale assessing attitudes relating to the change in lifestyle brought about by the birth of the infant. The items for the revised questionnaires and corresponding alpha coefficients are in Appendix C.

Hospital Questionnaires. The Hospital and Hospital Follow-up Questionnaires were designed to assess maternal perception of the hospital experience while in hospital and again at one month postpartum. A factor analysis of these questionnaires indicated that there were four subscales within each questionnaire. The four subscales of the Hospital Questionnaire (satisfaction with hospital experience, labour and birth, confidence concerning the mothering role and preparation for the mothering role) had Alpha coefficients greater than .80. Similarly, the four subscales of the Hospital Follow-up Questionnaire (confidence concerning the mothering role, satisfaction with experience on the postpartum unit, labour and birth, and satisfaction with the hospital experience) had Alpha coefficients .83 and over. The items and corresponding alphas for each subscale are in Appendix D.

Additional items from the Hospital questionnaire, not included in the subscales, provided the following information: how long the husband/partner was present during the labour and the birth; how long the baby was held at first contact; how long before the mother next saw her baby; how long the baby was held during the first twelve hours postpartum; a rating of the mother's subjective experience of birth; and the length of time taken to develop maternal feelings towards the baby.

Stress and Social Support. Social support has been defined as assistance or nurturance given by one individual to another, often in the form of material aid, services, information or emotional support (Tietjen & Bradley, Note 4).

Social support has been shown to contribute negatively to illness (Dean & Lin, 1977; Lin, Simeone, Ensel, & Kwo, 1979), and is considered a buffer against the experience of stress (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983; Mueller, 1980; Surtees, 1980).

More recently, it was been shown that decrease in social support in family and work environment was related to psychological maladjustment (Holohan & Moos 1981).

The role of social support during the transition to parenthood is relatively unexplored, even though this transition has been called one of the most stressful events in adulthood (Miller & Sollie, 1980). It has been found that psychosocial assets reduced the likelihood of complications during pregnancy and birth for women who had experienced high levels of lifechange during pregnancy (Nuckolls, Cassel, & Caplan, 1972).

Newton and his associates (Newton, Webster, Binu, Maskrey & Phillips 1979) have reported high levels of psychosocial stress in mothers who had preterm babies. Cronenwett (1980) suggested that social support would lessen the impact of the crises of adjusting to a new baby. Social stress has been related to complications of pregnancy and parenting. In turn, social problems and isolation has been found related to child abuse (Hunter, Kelstrom, Kraybill & Loda, 1978; Hirsch, 1980).

At each home interview the mothers were asked about their perceived level of social support and levels of stress. This subjective approach was similar to that of Crockenberg (1981) based on the assumption that the impact of an event depends upon how that event is perceived and experienced by the individual. The items for the social support and stress questionnaires are in Appendix E.

Measures of Infant Functioning

Brazelton Neonatal Behavioral Assessment Scale . After the birth of the baby, the Brazelton Neonatal Behavioral Assessment Scale (Brazelton, 1973) was administered to approximately one-third of the full-term babies in the study between day one and day four (mean 3.21 days, SD 1.32).

Carey Infant Temperament Questionnaire. Temperament has been defined as "individual differences in reactivity and self-regulation" and is assumed to have a constitution basis which is influenced by the interaction of hereditary, life experience and maturation. Temperament measures are not, however, independent of the child's environment (Rothbart, 1981; Rothbart & Derryberry, in press). Infant temperament was chosen in order to assess whether maternal psychological functioning is associated with the characteristics of the child. When the infants were six months of age, their mothers completed the Carey Infant Temperament Questionnaire (Carey, 1970, 1972; Carey & McDevitt, 1978). This is a 95-item questionnaire in which mothers are asked to rate their infant's reaction to his or her environment. Responses are broken down into nine category scores and an infant is described as "easy" or "difficult" based on these categories. The Carey Infant Temperament questionnaire has been shown to be stable; related to infant development; behaviour problems; risk status and maternal infant interaction patterns (Carey & McDevitt, 1978; Sostek, 1978)

Bayley Scales of Infant Development. When the infant was twelve months of age, the Bayley Scales of Infant Development (Bayley, 1969) were administered at the home visit. These scales were administered and scored according to the instructions in the manual. These scales are designed to provide an evaluation of the development of the child in the first 30 months.

Strange Situation. Following the home visit at twelve months postpartum, the mothers and infants came to the Department of Psychology at the University of British Columbia to participate in a laboratory assessment of maternal-infant attachment. Waters and associates (Waters, Vaughn, & Egeland, 1980) pointed out that as the onset of attachment is not a discrete event related to particular behaviours, it is difficult to study. However, most infants have achieved several major milestones of social development by twelve months which can be summarized by the concept of attachment. Lamb (1982b) has cited studies supporting the concept of secure-anxious attachment. For example, securely attached infants are more sociable and cooperative than insecure infants. Securely attached infants are more socially competent with their peers, and securely attached infants are more persistent and enthusiastic in challenging situations.

The Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978), consists of seven 3-minute episodes. The infant was placed in an unfamiliar room containing toys, a "stranger" and his/her mother. There were two brief separation and reunion episodes with the mother. In the first separation the infant was left with the stranger; in the second separation the infant was left alone. Episodes were terminated if the infant became distressed. The segments of the Strange Situation were recorded on a video tape recorder through a one-way mirror. All coding, scoring and classification was done on the basis of the filmed sequences. The behaviour of the infant towards his/her mother was coded, scored and categorised according to the instructions outlined by Ainsworth et al. (1978). Infants were classified as securely attached if (1) the presence of the mother supported the exploration of the room and toys and facilitated a return to exploration after the separation episodes, and (2) when contact or interaction with the mother upon reunion was effective in terminating distress. Insecurely attached infants were classified thus when they were either very avoidant of the mother upon reunion or were highly ambivalent towards her.

Home visits

Initial Interview. Detailed descriptive information was obtained from the participants at the Initial Interview by the Nurse Researcher. This included: demographic status; general and mental health status; lifestyle behaviours, such as smoking, use of alcohol, use of over-the-counter drugs; information related to the maternal weight and weight gain during pregnancy,

Postpartum visits. At each postpartum home visit, the Nurse Interviewers elicited information from the women relating to method of infant feeding; problems relating to the women and to their babies; lifestyle behaviours, that is, smoking, and use of alcohol. In addition, the Nurse Interviewers ascertained level of social support and of stress of the mothers.

Medical records

After the birth the hospital medical chart of each woman was examined by the Project Director and the necessary information relating to her labour, birth, and baby was extracted. All hospitals used the B.C. Perinatal Record (Towell & Dixon-Warren, 1978).

Statistical Analyses

The major statistical techniques used included the following: Chi Square contingency tests; t-test test; analysis of variance; Hotellings T^2. In any analysis involving more than two groups, the analysis of variance was followed by multiple comparisons, using the Newman-Keuls procedure. If Hotellings T^2 were used, multiple comparisons were conducted using the Scheffe procedure. An alpha level of .05 was used to differentiate between significant and non-significant results. Because of the exploratory nature of the analyses, two tailed tests of significance were used (McNemar, 1962).

The reported findings are based on the responses of complete data on a particular scale, variable or combination of variables being investigated. Hence, the number of individuals included in each analysis have been specified.

CHAPTER III

PSYCHOLOGY AND BIRTH

Literature Review

Dissatisfaction with the Birth

During the past ten years, there has been an increasing dissatisfaction with childbirth methods, practices, and procedures in North America. Sources of dissatisfaction include: birthing practices that are increasingly oriented to high risk; actively managed birth as the norm; reproduction separated from its social context; increasing use of high technology; increasing use of episiotomy and cesarean section (Arms, 1975; Elkins, 1980; Haire, 1978; Jones, 1976; Jordan, 1980; Kitzinger, 1979a, 1979b; Meyer, 1981; Oakley, 1980; Young, 1978; Young & Mahan, 1980). Normal low risk birth is often managed by a whole set of routine procedures, for example, pubic shaves, enemas, fetal heart monitoring, intravenous fluids, induction of labour, use of drugs, anaesthetics, use of forceps, episiotomies. (Elkins, 1980). The consensus seems to be that the physiological model has been replaced by the medical model; that childbirth, once a natural event, has become a clinical event (Kitzinger, 1978b). Because childbirth has been defined as a medical event research has focused on the pathological aspects of childbirth rather than the normal (Jordan, 1980).

Cesarean Section

The cesarean section rate in North America has increased from 4 - 6% in 1974 to 12 - 15% in 1980, and in the larger teaching hospitals to 20 - 30% (Elkins, 1980; Marieskind, Note 5).

It has been pointed out that an unexpected Cesarean birth (often following a long, arduous labour) can be a devastating experience, resulting in feelings that range from disappointment and anger to happiness and relief (Affonso & Stichler, 1978; Cohen, 1977). It has been claimed that not only a painful labour, traumatic birth, and forced maternal/infant separation can easily create hostile maternal feelings, but also that the degree of pain a mother experiences immediately after a Cesarean section may adversely affect maternal-infant bonding (Donovan & Allen, 1977).

The distribution of psychiatric admission and correlates of psychiatric admission of all women residing in Edinburgh (Scotland) between 1971 and 1977 was examined. It was found that having a first baby, being unmarried and undergoing a cesarean section were all associated with an increased risk of a psychiatric admission (Kendell, Rennie, Clarke, & Dean, 1981).

Marut and Mercer (1979) compared 20 women who had a Cesarean birth with 20 women who had a vaginal birth to determine differences in their perceptions of the birth experience. Their study showed that a Cesarean section had a negative impact on the mother's perceptions of her labour and birth experience. They stated that a mother was not only physically affected by the stress of surgical birth, but also experienced psychological and emotional stress.

Maternal attitudes. McClellan and Cabianca (1980), investigated the effects of early infant contact on the perceptions, attitudes and behaviour of mothers following a Cesarean birth. Results of their study suggested that early contact between mother and infant following a Cesarean birth enhances maternal perception of the infant and maternal attitudes during the first or second postpartum day. This was not seen when the infant was one month old. However, mothers who had early contact with their infant during the postpartum period, showed significantly more maternal caretaking behaviour when the infant was one month than mothers who had only brief contact.

Psychological functioning. There have been few psychological studies specifically designed to ascertain the relationship between type of birth and maternal functioning. Cox and Smith (1982) reported that at one month after the birth, women who had a cesarean birth had significantly lower scores on a measure of self-esteem than the women who had a vaginal birth. In a study of Black women of mixed parity, Field and Widmayer (Note 6) found that the women who had a cesarean birth were more anxious and less positive regarding labour and birth than were those who had a vaginal birth. In a study of Caucasian women of mixed parity, Grossman and associates (1980) found that the cesarean group were judged as adapting less well to labour and birth in the early postpartum period and were strongly negative about their birth experience. In both these studies, neither previous experience of birth nor previous experience with a cesarean section was controlled for.

In an evaluation of family centred maternity care a significant difference was seen in level of depressive affect immediately after the birth between women who had a cesarean birth and those women who had a vaginal birth (Bradley, 1977). However, this finding was not replicated in a later study (Bradley, Ross, & Warnyca, Note 3).

Spontaneous Vaginal versus Forceps Assisted Vaginal Births

The conflicting findings reported in the above studies, taken in conjunction with the birth literature, suggest the possibility of an attenuation effect due to the definition of the vaginal comparison group. The emphasis in the literature, and in the expression of clinical and consumer concerns, has focussed almost exclusively on the physical and emotional sequellae of a cesarean birth. It is conceivable, however, that a difficult vaginal birth (e.g. a forceps birth), might be as distressing as a cesarean birth. Typically, such a distinction in the definition of the vaginal group has not been made; spontaneous vaginal births and forceps births have been included in the same category. In order to identify differences, it is necessary to study them as separate groups.

In a recent study, O'Hara, Rehm, & Campbell, (1982) obtained a 3-point delivery stress rating by categorizing birth as follows: a spontaneous vaginal birth was assigned a rating of 1; forceps or cesarean birth was rated a 2; a rotation or breech birth was rated 3. These authors reported an inverse relationship between delivery stress and postpartum depression. There are several methodological problems inherent in this approach. First, the three categories are not mutually exclusive; second, the categories are not ordered in increasing level of intervention; and third, rotation or a breech birth is not a method of birth per se. Therefore, the conclusion that women who have a spontaneous vaginal birth are more likely to be depressed should be questioned.

The women in this study were classified according to method of birth, that is a spontaneous vaginal (109), forceps assisted birth (100) or an unplanned cesarean birth (44). The women who had an elective cesarean (7) or a home birth (2) were not included in the following exploration of an association between method of birth and maternal psychological functioning.

Results

Prenatal Period

The prenatal data were examined to ascertain the comparability of the three birth groups in question (spontaneous vaginal, forceps, cesarean) in terms of their demographic characteristics, their general health during pregnancy, and their psychological status prior to the birth of their infant.

Demographic variables. There were no significant differences among the three birth groups in terms of their age, occupation, level of education, family income, type of prenatal class attended, or the hospital attended.

Health related variables. At the initial interview women rated themselves on a three point scale regarding their general physical and mental health during pregnancy. No significant differences were identified between reported state of mental or physical health and type of birth.

An analysis of variance indicated that there was no significant difference among the three birth groups regarding their pregravid weight (sample mean = 56.25 kg (124 pounds), SD = 7.39 kg (16.28). There was, however, a significant difference in terms of weight gain during pregnancy, $F\ (2, 229) = 5.15$, $p < .007$. The women who had a cesarean birth gained significantly more weight during pregnancy ($M = 17.01$ kg (37.5 pounds), SD = 5.44 (12) than the women who had a forceps birth ($M = 15.20$ kg (33.5 pounds), SD = 4.54 (10), or a spontaneous vaginal birth ($M = 14.38$ kg (31.7 pounds), SD = 3.62 (8). In addition, a significant effect was found with respect to length of gestation, $F\ (2, 239) = 5.05$, $p < .007$. The cesarean group had a longer mean gestation period (40.5 weeks, SD = 1.52) than either the forceps group (39.9 weeks, SD = 1.50) or the spontaneous group (39.6 weeks, SD = 1.70).

Psychological functioning. The analysis of variance for the three birth groups conducted on the psychological measures completed during the prenatal period (PRF, DACL, A-trait, A-state, Mood, Self-esteem, Social adjustment) revealed that there were no significant differences among the groups of women on any of these measures either at the Initial Interview or at the 35 weeks gestation period. The responses to the questionnaires involving feelings towards pregnancy and concerns regarding labour and birth did not differ.

Birth Related Variables

Obstetric variables were examined to ascertain whether there were relationships between type of birth and induction, fetal monitoring, use of anaesthesia, length of hospital stay, number of husbands/partners present during birth, mother's initial contact with baby and length of wait for next contact, and indications of infant health.

Descriptive information relating to the obstetric and infant birth variables are outlined in Appendix N and Appendix O.

Induction. There was a significant relationship between induction of labour and type of birth, X^2 (2) = 18.15, $p < .0001$. Labour was induced in: 62% of the cesarean group, 47% of the forceps group, and 26% of the spontaneous group. There was no relationship, however, between type of birth and method of induction.

Fetal monitoring. A significant relationship existed between the use of fetal monitoring and type of birth, X^2 (6) = 36.93, $p < .0001$: Electronic fetal monitoring during labour: 83% of the cesarean group, 50% of the forceps group, and 27% of the spontaneous group.

Length of labour. It was impossible to compare the three groups of women with respect to the length of their labour. In most cases, data relating to the length of labour of a woman who subsequently had a cesarean birth was not recorded.

Anaesthesia. There was a significant relationship between type of birth and type of anaesthetic used during the birth, X^2 (4) = 169.65, $p < .01$. No anaesthetic: 5% of the spontaneous group and 3% of the forceps group. Local anaesthetic: 59% of the spontaneous group and 5% of the forceps group. Regional anaesthetics: 36% of the spontaneous group, 92% of the forceps groups, and 55% of the cesarean group. The remainder of the cesarean group (45%) had a general anaesthetic.

Cesarean births. Examination of the medical records indicated that the condition most cited for the reason for an unplanned cesarean section was cephalopelvic disproportion or malpresentation, 41%; uterine inertia accounted for 31%; fetal distress 17%; prolonged rupture of membranes (over 24 hours) 7%; prolonged labour (over 24 hours) 2%; and other 2%.

Episiotomy. Finally, it was noted that 98% of the women who had vaginal births (spontaneous and forceps combined) had either an episiotomy (85%) or a tear (13%). Only 2% had an intact perineum after the birth of their baby.

Hospital stay. An analysis of variance indicated that there was a significant difference in the number of days the mothers within each group stayed in hospital after the birth of their baby, $F\ (2, 239) = 9.23$, $p < .0001$. Mothers who had a cesarean birth stayed in hospital significantly longer ($M = 8.21$ days, $SD = 5.3$) than those who had a forceps birth ($M = 6.06$ days, $SS = 4.8$) who in turn stayed in hospital significantly longer than those who had a spontaneous birth ($M = 5.0$ days, $SD = 2.1$).

Husbands/partners. A significant relationship was found between type of birth and the number of husbands/partners present during the birth, $X^2\ (2) = 107.51$, $p < .0001$. More husbands/partners were present during the spontaneous births

(97%) and the forceps births (94%) than were present during the cesarean births (28%).

Contact with baby. There was a significant relationship between time of first holding the baby after the birth and type of birth, X^2 (16) = 74.77, $p < .0001$. Able to hold baby within the first hour: 94% of the spontaneous vaginal group; 85% of the forceps group and 38% of the cesarean group. In addition, an analysis of variance showed that those who had a cesarean birth had to wait significantly longer before they next saw their baby, F (2, 211) = 12.75, $p < .0001$. The mean number of hours for the cesarean group was 9.3, for the forceps group it was 5.6 hours and for the spontaneous vaginal group it was 4.7 hours.

Indications of Infant Health

Apgar at one and five minutes. Analysis of variance revealed no significant differences between Apgar scores for the babies either at one minute or five minutes after their birth. The mean Apgar score for the babies at one minute was 7.92 (SD = 1.7) and at five minutes after their birth 9.21 (SD = 0.91).

Birthweight. There was a significant difference in birthweight among the babies in the three groups, F (2,248) = 9.78, $p <.0001$. The babies born by a cesarean section weighed significantly more (M = 3810 g, SD = 634 g) than the babies born by a spontaneous birth (M = 3402 g, SD = 516 g) or forceps birth (M = 3470 g, SD = 477 g).

Nursery placement. Thirty-eight percent of the babies went to the Intensive Care Nursery immediately after their birth. There was a significant relationship between type of birth and placement in regular or intensive care nursery. X^2 (4) = 60.66, $p < .0001$. Regular nursery: 74% of the babies in the spontaneous group; 69% of the babies in the forceps group and 7% of babies in the cesarean group.

Postpartum Period

Experience of birth. In response to the nurse interviewers questions in hospital, a higher proportion of the spontaneous vaginal group rated their labour and birth experience as easy as opposed to difficult and rated it short as opposed to long. This relationship between birth and ratings of experience was statistically significant, X^2 (2) = 31.79, $p < .0001$ and X^2 (2) = 39.89, $p < .0001$, respectively. Fifty-two percent of the vaginal group rated their birth as difficult; 85% of the forceps groups; and 92% of the cesarean group rated their birth as difficult. A similar relationship was seen between the long/short dimension. Twenty-eight of the vaginal group perceived the birth process as long; 76% of the forcep group; and 78% of the cesarean group perceived that their birth was long.

Quality of experience. There was a significant difference in the overall rating of the birth experience (on a 5-point scale ranging from the worst experience to the most wonderful experience), F (2, 219) = 18.88, $p < .0001$. Women who had a spontaneous birth rated their birth significantly more highly than did women who had a forceps birth, who in turn rated their experience more highly than those women who had a cesarean birth. A similar significant difference was found among the three groups in written material completed towards the end of the hospital stay. Responses of the three groups of women on the attitude towards labour questionnaire completed in hospital were analysed using analysis of variance. There was a significant difference among the three groups, F (2, 206) = 11.82, p < 000. Subsequent multiple comparisons using the Newman-Keuls procedure revealed that the spontaneous vaginal women had a significantly more positive attitude towards their labour than did the forceps or cesarean group.

Hospital Experience. An analysis of variance conducted on the four subscales of the Hospital Questionnaire revealed that there were no significant differences among the three groups of women on the subscales designed to measure (a) the hospital experience generally, (b) confidence concerning the mothering role, and (c) preparation in hospital for the mothering role. There was a significant difference, however, among the three groups on the subscale relating to the birth experience, F (2, 220) = 10.28, p < .0001. Subsequent multiple comparisons indicated that the spontaneous vaginal group had the highest score, the forceps group next and the cesarean group the least positive score. This pattern was repeated on the Hospital Follow-up Questionnaire completed at one month postpartum, F (2,233) = 34.94, p <.0001. No significant differences were found in the subscales measuring confidence concerning the mothering role, satisfaction with experience on the postpartum unit, or satisfaction with the hospital experience generally but a significant difference was found with respect to the subscale measuring perception of the birth experience. Newman-Keuls procedure indicated that the women who had a spontaneous birth scored significantly higher on this subscale followed by the forceps group and then by the women who had a cesarean birth. The frequencies, means and standard deviations for the birth variables are provided in Table 3.

Maternal Feelings. There was no relationship among the three birth groups and feelings towards the baby while in hospital: 53% of the women reported that maternal feelings developed immediately, 26.2% said within the first day, 12.2% by the third day, 7.7% said they were beginning to develop by the day prior to discharge, and 1.4% said they had not yet had such feelings on the day prior to discharge.

There was, however, no association between maternal feelings for the baby and method of birth.

Psychological functioning. Analyses of variance for the three birth groups were carried out on the measures of maternal psychological functioning completed after the birth of the baby.

There were no significant differences among the three birth groups after the birth of the baby on any of the following measures completed in hospital, after one week, at one, three, six or twelve months postpartum: anxiety, depressive affect, mood, self-esteem, social adjustment, marital adjustment. Nor were there differences in maternal reports of levels of stress and perceived social support.

There were no significant differences among the three birth groups with respect to confidence in caregiving at one week and one month; or in their attitude towards lifestyle change at one week or one month.

At three months, however, a significant difference

TABLE 3

Means and Standard Deviations of the Birth Variables

	Spontaneous	Forceps	Cesarean	p
Attitude to labor				
$\bar{X}$	22.19	19.32	18.06	.0000
SD	4.65	5.70	4.08	
Rating of birth				
Easy	48%	15%	8%	.001
Short	72%	24%	22%	.0001
Wonderful				
$\bar{X}$	3.52	2.82	2.26	.0001
SD	1.11	1.25	1.01	
Birth Subscale				
In hospital				
$\bar{X}$	67.64	63.97	57.97	.0001
SD	10.94	11.28	11.40	
1 Month				
$\bar{X}$	26.36	21.45	17.49	.0001
SD	5.78	6.85	5.09	

existed among the three groups, F (2,229) = 3.44, p <.033. Subsequent multiple comparisons revealed that the spontaneous vaginal group had a significantly more positive attitude regarding lifestyle changes than the cesarean group, but did not differ from the forceps groups. No significant differences showed between the forceps or cesarean groups.

At six and twelve months there were no significant differences between the three birth groups.

Infant variables. Chi square indicated that there was no relationship between type of birth, method of feeding, length of time breastfeeding, illness of infant, or colic during the study. Chi square analyses also revealed that there was no association between method of birth and maternal ratings of infant temperament. There was no significant difference in the scores obtained by the infants in the three groups, on the Bayley Scales of Infant Development completed at one year of age. The relationship between type of birth and infant classification in the Strange Situation at 12 months was examined. These analyses revealed no association between security of attachment and whether the mother had a difficult birth.

Discussion

Method of Birth

For this sample of women, method of birth was not found to be a major variable relative to maternal adjustment and feelings towards the baby, as is so frequently portrayed in the literature. No significant differences in emotional sequellae were found among the women who had different types of birth. Women who had a cesarean or forceps birth felt significantly less positive about their birth experience but there were no indications of psychological or maternal risk in the postpartum period. These findings are important from the perspective of those women who do have to have a cesarean section and who are concerned about their relationship with their baby. The findings also indicate that women can overcome a negative birth experience and still feel good about themselves and their baby.

The evidence suggests that a difficult birth is not necessarily followed by negative maternal feelings and attitudes towards the baby or by less positive psychological functioning in the immediate postpartum or at the three, six or twelve month follow-up. Neither is method of birth related to the secure/anxious attachment behaviours of the infant at the age of one year.

No Psychological Risk to Maternal Attitude

The present study may conflict with the values and beliefs of many who are working towards the demedicalization of childbirth, particularly those who are working to effect change in the increasing cesarean section rate. It should be emphasized that discounting psychological risk does not discount the many other risks involved in performing cesarean sections (Marieskind, Note 5; Young & Mahan, 1980). Also to be emphasized is that the women who had a cesarean and forceps birth did respond negatively to their birth experience. What this study demonstrated was that this negative feeling about the birth was not reflected in their level of psychological functioning nor in their maternal attitudes and feelings.

How the women in this study felt about the birth and hospital experience was unrelated to how they felt about the baby. These findings corroborate those of a previous study (Bradley et al., Note 7) in which it was stated that for heuristic purposes, a clearer distinction should be made between the birth process itself and maternal feelings towards the infant. Even though nearly 40% of the babies were taken to the intensive care nursery immediately after the birth, and even though there were significant differences among the three groups relating to the amount and timing of contact with their babies in the immediate postpartum period, there were no significant differences in feelings and attitudes towards their baby, in feelings of confidence in caring for the baby or in the development of maternal feelings. There is a caveat with respect to these findings, namely, that they are based on the self-report of the women. However, the Nurse Interviewers who visited the women in hospital, and three times during the follow-up period did not report any major concerns regarding the maternal-infant relationship.

These findings support results of researchers working in similar areas (Campbell & Taylor, 1979; Farber, Vaughn, & Egeland, 1981; Svedja, Campos, & Emde, 1980), as well as a longitudinal study in the United States (Grossman et al., 1980), and a more recent study by Celotta (1982).

Negative Birth Experience

Evidence from this study suggests that women do not forget or repress the unpleasant aspect of their birthing experience. While all three groups were similar regarding their hospital experience, the two groups of women who experienced intervention expressed more negative feelings about labour and childbirth to their nurse interviewer while in hospital. This negativity was also reflected in their responses to the birth subscales of the attitude questionnaires.

Results of the analyses show that there is a consistently significant difference in hospital and at the one month follow-up period among each of the three groups of women relating to their birth experience. Women who had a spontaneous vaginal birth rated their experience significantly more positively than the women who had a forceps birth who in turn rated their experience significantly more positively than those who had a cesarean birth. In addition, women who had a spontaneous birth rated their labour as short as opposed to long and easy as opposed to difficult compared with women who had a forceps or cesarean birth. The above findings are supported by the more clinical and anecdotal reports in the nursing literature and suggest that women are realistic and consistent about their childbirth experience.

It is important to emphasize that it was not only those women who had a cesarean birth, but also those who had a forceps birth who felt significantly more negative about their experience while in hospital and at one month postpartum. In fact, the data consistently indicate a gradation of negative feelings depending on increasing levels of intervention i.e. spontaneous vaginal, forceps or cesarean birth.

Childbirth Preparation Classes

All the women in this study were volunteers and participated in childbirth classes. It has been said, "they {the classes} seem to be more tied to the medical system, preparing women realistically perhaps, for the kind of experience they will have rather than suggesting possible alternatives" (Hartman, Neilson, & Reynolds, 1979, pp.751-752). This may be the case and may help explain why so few differences were observed among the birth groups. The work of Lipson and Tilden (1980) indicated that the women in their study who were better prepared for a cesarean birth had a more positive experience and coped better emotionally after the birth.

Other researchers (Carlsson, Fagerberg, Horneman, Hwang, Larsson, Rodholm, Schaller, Danielsson, & Gundewall, 1979; Svejda et al., 1980) suggested that influences on early maternal responsiveness include demographic status, support of the father, and prenatal education. Svejda et al. (1980) raised the possibility that prepared, educated, low risk women are "near ceiling for maternal interest and responsiveness" (p. 778).

Hospital Care

The possibility also exists that the findings are related to the health care received in the hospital. Lipson and Tilden (1980) have suggested that a supportive interpersonal environment and family centred maternity care can enhance the cesarean childbirth experience. The philosophy of the three hospitals is one of family centred maternity care, although there are variations in the ways in which the philosophy is put into practise. The women who had a cesarean birth stayed in hospital on the average two - three days longer than those having a forceps or vaginal birth. It is possible that the cesarean mother, in particular, benefitted from the extra care and attention in hospital and from the extra contact with her baby while she was in hospital. It has been shown that women who had a cesarean birth were more satisfied with the help that they received from nursing personnel and felt less worried about coping with their baby than women who had had a vaginal birth (Bradley et al., Note 7).

Intervention

Although the issues of medicalization of childbirth was not the focus of this study, the birth outcomes obtained illustrated the reason for current concerns surrounding childbirth. Despite being healthy, well-educated and prepared for birth, a high percentage of women in this study had some type of intervention, whether a cesarean section, forceps, episiotomy or anaesthetic. Moreover, if one looks at the use of analgesics and anaesthetics it becomes apparent that nearly twice as many women having a forceps birth as women having a spontaneous birth have continuous epidural during labour; and that more than three times as many women who have a forceps birth have an epidural anaesthetic for the birth.

Episiotomy.

The use of episiotomy was very high among the women in this study - 98% of vaginal births. This may relate to the training and experience of the health professionals, and to the lack of teaching of birthing techniques such as perineal massage, gentle pushing, slow birth of head. Too rapid a birth does not allow the perineum to stretch sufficiently. It is desirable to slow the birth process thus enabling the pelvic floor and perineum to dilate gradually, thus avoiding an episiotomy (Moore, 1977).

Costs

It should be emphasized that not only is a cesarean section a more costly procedure in terms of physicians' fees and hospital costs, but also women who had a cesarean birth remained in hospital an average of three days longer than the spontaneous vaginal; forceps were in hospital an average of one day longer.

Conclusion

To conclude, the major findings are that type of birth is unrelated to psychological functioning or maternal attitudes. However, the information obtained from the birth subscale indicated that greater emphasis could be placed on the interpersonal helping relationship by the attending staff during the birth. Items endorsed by the women suggest that greater communication is needed, and increased empathy and positive reinforcement during the birth process. Kitzinger (1978a) stated that it behooves us to pay more attention to the whole conduct of labour and to the birthing environment; providing a caring environment for the birth, one in which the mother feels secure and emotionally supported. As she said "Cherish the mother and she will spontaneously cherish the baby" (p. 154).

CHAPTER IV

THE CHILDBEARING YEAR

The Psychological Functioning of the Mother

Emotional Disturbance During Pregnancy

Anxiety. Anxiety during pregnancy has been related to maternal age, parity, general education, weight gain, the trimester of pregnancy, and infant attachment. Maternal anxiety has been associated with hyperemesis gravidarum, difficult and prolonged labour, habitual abortion, and maternal-infant attachment. Fetal complications related to maternal anxiety include prematurity, mental retardation, low birth weight, stillbirth and congenital deformity (Avant, 1981; Glazer, 1980; Reading, in press). There are studies demonstrating evidence of maternal anxiety, depression and cognitive dysfunction during pregnancy; that anxiety varies significantly as a function of the trimester of pregnancy; and that emotional upheavals are characteristic of pregnancy (Astbury, 1980; Leifer, 1977, 1980; Lubin, Gardner & Roth, 1975; Meares, Grimwade, Bickley & Wood, 1972).

Cox, Connor and Kendall (1982) administered a standardized psychiatric interview to 105 women of mixed parity. They found significant increases in the levels of anxiety and depression between the prenatal and postpartum scores obtained by the women. While Cox and associates found that depression was less common in the prenatal period, Kumar and Robson (1978b) reported that 16% to 21% of women in their study were depressed during their pregnancy.

Zajicek and Wolkind (1978) stated that 25% of the married women, in their sample of 94 women interviewed in their seventh month of pregnancy, reported distressing emotional symptoms during their pregnancy. The most common symptom was depression, usually associated with anxiety. They also found that emotional disorders were more likely to be experienced by those women who had shown emotional difficulties before they were pregnant.

Hayworth and associates (Hayworth & Little, 1980; Little, 1981) examined individual differences in attitudes and personal coping style during pregnancy. They found that high anxiety and hostility in the prenatal period were significantly associated with depression in the postpartum period, however, the authors did not measure level of depression in the prenatal period.

Other studies have shown, however, that women have good psychological adjustment during pregnancy (Barclay & Barclay, 1976; Hooke & Markes, 1962; Lips, 1982; Osborne, 1977). Barclay and associates (1976) compared pregnant and nonpregnant women on anxiety and attitudinal measures related to pregnancy. They concluded that the similarity between the two groups of women raised the question as to whether the items are relevant to the pregnancy experience.

In a more recent study Lips (1982) pointed out that certain physical and emotional symptoms are expected to be part of the normal pregnancy experience. Doctors are taught to expect such symptoms and pregnant women are counselled to expect symptoms. Lips pointed out that there is little known with respect to what proportion of pregnant women experience particular physical or emotional symptoms. Lips therefore studied 108 pregnant women and expectant fathers, nonpregnant women and nonexpectant fathers using two measures, the Beck Depression Index and a symptom checklist. Lips concluded that during the first five months of pregnancy, the pregnant women did not differ from the other non-pregnant groups as might have been expected.

Anxiety and labour. Recent studies of the relationship between maternal anxiety and labour have shown a consistent association between measures of anxiety and active labour (Klusman, 1975; Lederman, Lederman, Work, McCann, 1978, 1979)

Anxiety and pain. Level of anxiety is seen as the main factor modifying the pain experienced by the labouring woman (Connolly, Pancheri, Lucchetti, Salmassi, Geurrier, Francalancia, Barloleschi & Zichella, 1979). Although Connolly et al. (1979) reported that the pain experience during labour varied significantly from individual to individual depending on the structure of the personality, Zichella (1977) stated that levels of anxiety during labour contribute to the intensity of the pain felt during labour. He maintained that increased pain resulted from the effects of the anxiety rather than actual increase in noxious stimulation. Anxiety has been correlated with level of anasthetic (Zuckerman, Nurnberger, Gardiner, Vandiveer, Barrett, den Breeijen (1963). Spielberger and Jacobs (1979) cited a study published in 1977 by Falorni in which he reported that higher anxiety was associated with longer labour and more intense pain in labour. In addition, Beck, Siegel, Davidson, Kormeier, Breitenstein & Hall (1980) have suggested that there is evidence that anxiety may augment or even elicit the experience of pain.

Anxiety and obstetric outcome. Another area of research interest has been the investigation of anxiety and obstetric outcome.

This body of literature has been reviewed recently (Carlson & Labarba 1979; Chalmers, 1982, Reading, in press). All three reports concur that the evidence concerning the relationship between psychological functioning and obstetric factors must be considered equivocal due to the methodological problems with the majority of the studies. Their criticisms included the following: small sample sizes; heterogeneity of samples, retrospective design; inadequate control groups; absence of standardized measures of anxiety; variation in time of measurement; and variation in obstetric outcome measures chosen.

Confounding factors. One problem with the majority of studies reviewed was the socioeconomic status of the population of women studied. The relationship of anxiety to obstetric outcome was often confounded by the socioeconomic status of the women, since the majority of studies have used women from low socioeconomic class. This group are at high risk for a poor pregnancy outcome - in particular they are more likely to have a low birthweight baby (Wynn & Wynn, 1979). It has been found that low birth weight was related to increased incidence of stillbirth, neonatal death, poor infant development, cerebral palsy, mental retardation and lowered intelligence (Singer, Wesphal, Niswander, 1968).

Pregravid weight is also a confounding factor. Edwards, Alton, Barrada and Hakanson (1979) demonstrated that the underweight women in their study had significantly higher rates of cardiac/respiratory problems, anemia, and endometritis. Prematurity and low Apgar scores were significantly more frequent in the infants of underweight women.

Another important factor that has been overlooked in the studies reviewed is the obstetric history of the women. Women with a prior history of poor pregnancy outcome are at higher risk for a repetition, that is, prematurity, disability, fetal loss (Niswander & Gordon, 1972).

Emotional Disturbances During the Postpartum Period

The empirical evidence that exists regarding the nature of emotional changes during pregnancy and the postpartum is often inconsistent. With the exception of depression, the psychological functioning of women in the postpartum period has not been well investigated.

Depression. The emotional disturbance in the postpartum most often cited in the obstetric, gynecological or psychiatric literature is depression. Emotional disturbance in the postpartum has variously been called puerperal depression, postpartum adjustment, mental illness, emotional difficulties, and postpartum emotional disorder. These various definitions limit the comparability of the findings and any conclusions that may be made. Nevertheless, there are three types of postpartum psychiatric disorders that have been described in the literature - postpartum psychoses, postpartum depression and the "blues".

Postpartum psychoses. The general agreement is that postpartum psychosis is quite rare with most estimates falling below one in 500 births (Grundy & Roberts, 1975; Herzog & Detre, 1976; Kaij & Nilsson, 1972; Pitt, 1973; Pugh, Jerald, Schmidt &

Reed, 1963; Reich & Winokur, 1970). It has been pointed out that the psychoses must be regarded as a small group of diseases from a socio-medical point of view and of less significance than the minor psychiatric illness following pregnancy (Kaij & Nilsson, 1965). Moreover, researchers have concluded that there is little difference between puerperal and non-puerperal disorders (Herzog & Detre, 1976).

Postpartum depression. A postpartum depressive episode has been defined "as a persistent depressive syndrome lasting a minimum of six weeks, whose onset was within six months of the time of giving birth" (Baker, Dorzab, Winokur & Cadoret, 1971, p. 359). The syndrome is usually characterized by depression that extends beyond the first week after the birth of the baby, and lasts for a minimum of two weeks (DSM III, 1981). Investigators who have studied postpartum depression agree that tearfulness, emotional lability, anxiety, worry, poor concentration, mild confusion are typical symptoms of postpartum depression (Hamilton, 1962; Pitt, 1968; Yalom, 1968). Yalom and associates stated that because of the lack of consensual definition or objective studies of this syndrome, the incidence rates reported vary greatly. The majority of estimates range between 10% and 30% (Braverman & Roux, 1978; Hayworth, Little, Bonhan Carter, Raptopoulous, Priest & Sandler, 1980; Meares, Grimwade & Wood, 1976; Paykel, Emms, Fletcher & Rassaby, 1980; Pitt, 1968; Uddenberg & Englesson, 1978; Zajicek & Wolkind, 1978). Disagreement among researchers with respect to incidence rates appears to be a reflection of the varying diagnostic criteria.

While there is some conflict in the literature, the consensus among researchers appears to be that disorders occurring in association with childbearing are indistinguishable from those occurring at other times in terms of symptomatology and progress (Bardon, 1972; Bratfos & Haug, 1966; Brown & Shereshefsky, 1972; Dean & Kendall, 1981; Silverman, 1968; Steiner, 1979; Todd, 1964; Weiner, 1982; Wilson, Barglow & Shipman, 1972). Others agreed that the argument that postpartum depression is distinct from other forms of depression is not consistent with available evidence (Paykel, Emms, Fletcher & Rassaby, 1980; Pitt, 1973; Reich & Winokur, 1970; Atkinson & Rickel, Note 8).

Kaij, Nilsson and associates (Jacobson, Kaij, Nilsson, 1965; Nilsson, & Almgren, 1970) noted that investigations have indicated that neuroses, non-psychotic depressions or asthenic reactions are extremely common during the postpartum year, and indicated that as many as one woman in four experiences more or less incapacitating neurotic and/or depressive symptoms during this period. These authors stated that "Systematic investigations on incidence, etiology, prognosis and symptoms of neurotic reactions in pregnancy and puerperium are virtually non-existent" (Kaij & Nilsson, 1972, p. 398). Feggetter, Cooper & Gath, (1981) concluded that it was difficult to draw firm conclusions from the studies which have concentrated on the early postpartum as there is little detailed investigation of non-psychotic puerperal disorders.

The "Blues". Yalom, Lunde, Moos, Hamburg (1968) stated that the occurrence of postpartum blues is "... so ubiquitous and ostensibly benign that it has not often been deemed worthy of serious study" (p. 16). According to Pitt (1968), transitory tearfulness in the early puerperium is common and is generally regarded as a normal phenomenon. Pitt maintained that the "blues" is a "trivial, fleeting phenomenon" and should not be confused with the "atypical" or neurotic form of puerperal depression. Such mild postpartum depression is known as maternity or 3rd day blues, and occurs at some point during the first ten days postpartum, though typically around the third or fourth day. Reported symptoms include tearfulness, despondency, confusion, inability to concentrate, vulnerability to minor rebuffs, tension, anxiety, irritability and fatigue (Hamilton, 1962; Yalom, Lunde, Moos, Hamburg, 1968; Pitt, 1968).

The reported onset of depression in the postpartum varies. Vandebergh (1980), stated that the onset of postpartum depression can be any time; other observers reported that it occurs between three to four days postpartum (Ballinger, Buckley, Naylor, & Stansfield, 1979; et al. 1979; Dalton, 1971; Nott, Franklin, Armitage, & Gelder, 1976; Pitt, 1973; Yalom, Lunde, Moos, Hamburg, 1968). The postulated reasons for the postpartum "blues" have been attributed to hormonal changes, psychological difficulties, physical discomfort, and the onset of lactation (Pitt, 1968). The onset of depression coincides with the drop in progesterone and oestrogen immediately following the birth, leading some researchers to postulate a hormonal cause (Dalton, 1971; Meares et al. 1976; Paykel et al.

1980; Vanderberg, 1980). Reviewers of this literature reported that physiological evidence of a relationship between hormonal levels and postpartum depression is inconsistent and the postulated connection "mere speculation" (Gelder, 1978; Steiner, 1979). Others have said that the evidence for hormonal and other metabolic changes occurring during and around childbirth is weak and inconclusive (Kendell, Rennie, Clark, Dean, 1981; Nott, Franklin, Armitage, & Gelder, 1976; Ballinger, et al., 1979; Handley, Dun, Waldron, & Baker, 1980).

Weight loss in the immediate postpartum has recently been implicated as a determinant of postpartum depression (Stein, 1980). Others are investigating the absolute or relative lack of circulating tryptophen as a determinant (Handley et al., 1980).

To conclude, the body of literature concerned with depressive disorders associated with childbearing women is replete with methodological and conceptual difficulties: there are the problems with definitional confusion; problems with inadequate measurement; a lack of theoretical constructs or propositions which would guide those conducting research in this area; and a lack of empirical data.

Psychological Theories

Recently several researchers have attempted to investigate postpartum depression under the rubric of current theories of depression: the cognitive, behavioural, and learned helplessness (Beck, 1974; Lewinsohn, 1974; Seligman, 1975).

It has been suggested that the learned helplessness model of depression may be applicable to mild postpartum depression

(Bradley, 1977; Hayworth, et al., 1980; Catano & Catano, Note 9). These authors suggest that mild postpartum depression results from a woman's perceived lack of control over her childbirth experience. Two studies have tested the reformulated learned helplessness model of depression as it relates to maternal functioning in the postpartum. (Manley, McMahon, Bradley, and Davidson, 1982; Cutrona, Note 10) According to Cutrona, her study provided limited support for this model. She found that depressive attribution style did not predict onset of depression among women who were not depressed initially, whereas inadequate social support was a strong predictor at each time point. Manley and associates (1982) reported similar results, with negligible support for the notion of depressive attributional style. In another study, O'Hara et al. (1982) found that prenatal depression, stressful life events, stress surrounding the birth and attributional style predicted the level of postpartum depression.

It is clear from the foregoing that the present status of knowledge relating to the psychological functioning of women during pregnancy and childbirth is remarkably contradictory, and in the postpartum period remarkably sparse.

Results

The present study was designed to clarify some of the above issues using a large homogeneous sample of women expecting their first baby. Upon examination of the scores obtained on the measures of anxiety and depression it became obvious that this sample was neither anxious nor clinically depressed during their childbearing year (although there were some individual women who might be classified as mild to moderately depressed). It was decided, therefore, to compare those women who scored at or below the 25th percentile on the measure of depression with those who scored at or above the 75th percentile. Similarly, with anxiety, those who scored at or below the 25th percentile were compared with those who scored at or above the 75th percentile. The cut-off scores, means and standard deviations for those classified as high and low anxiety and depression are in Appendix P. The percentage of individuals who changed from high to low (and vice- versa) at each time point throughout the study is also listed.

Prenatal period - second trimester

Demographic variables. To ascertain whether the high/low anxiety and depression groups were comparable with respect to their demographic characteristics, Hotellings T^2 was conducted on this set of variables. There was no relationship between anxiety or depressive affect and age, education, occupation, income or number of years married. The means and standard deviations for these data are in Table 4.

Personality. The responses of the women to the Personality Research Form were compared using t-test. Inspection of Table 5 reveals that those who scored highly on measures of anxiety obtained significantly lower scores on the affiliation and order subscales of the Personality Research Form; t (109) = 2.35, $p < .021$ and t (109) = 2.37, $p <.019$ respectively. They scored significantly higher on the subscales of aggression and impulsivity than the low anxious

TABLE 4

Means and Standard Deviations of Variables in the Demographic Domain – Obtained in Second Trimester of Pregnancy (20 Weeks)

	Low Anxiety			High Anxiety			p	Low Depression			High Depression		
Variable	N	$\overline{X}$	SD	N	$\overline{X}$	SD		N	$\overline{X}$	SD	N	$\overline{X}$	SD
Age	66	28.53	4.34	63	28.11	4.12	NS	71	28.32	4.03	67	27.87	4.50
Education	66	3.21	1.02	63	3.40	0.98	NS	71	3.21	0.94	67	3.22	0.99
Occupation	58	3.00	1.09	56	3.02	1.23	NS	63	3.06	1.08	60	3.10	1.18
Number of Years Married	66	4.30	2.68	63	3.83	2.59	NS	71	4.30	2.73	67	4.07	2.41

Hotellings T^2 $\underline{F}(4,124) = 1.3395$

Low = 66 High = 63

Hotellings T^2 $\underline{F}(4,126) = .30484$

Low = 70 High = 61

TABLE 5

Means and Standard Deviations of Personality Subscales
Completed in Second Trimester of Pregnancy (20 Weeks)

	Low Anxiety N=54		High Anxiety N=57		p	Low Depression N=62		High Depression N=59		p
	$\overline{X}$	SD	$\overline{X}$	SD		$\overline{X}$	SD	$\overline{X}$	SD	
Abasement	42.52	8.27	42.21	7.59	NS	45.18	8.60	43.42	7.38	NS
Achievement	47.52	7.95	48.30	9.69	NS	47.68	8.46	47.69	8.91	NS
Affiliation	49.46	8.31	45.40	9.79	.02	51.03	8.93	45.44	9.39	.00
Aggression	47.37	6.15	52.75	7.13	.00	48.31	7.74	50.78	6.57	NS
Autonomy	43.78	7.73	46.91	9.09	NS	43.90	7.69	47.02	9.02	.04
Change	43.48	6.24	46.18	9.11	NS	43.81	7.38	46.00	7.31	NS
Cognitive Structure	53.70	8.04	53.53	8.32	NS	50.60	9.54	54.22	8.20	.03
Defendence	49.69	7.37	52.25	8.08	NS	49.98	8.76	52.20	7.32	NS
Dominance	48.50	9.41	49.63	8.10	NS	49.59	9.09	47.20	8.21	NS
Endurance	47.61	9.00	46.95	8.10	NS	47.16	10.79	46.83	8.04	NS
Exhibition	46.24	7.90	46.40	8.80	NS	48.82	8.41	45.29	8.32	.02
Harm Avoidance	57.52	5.75	56.68	6.40	NS	56.71	6.02	56.63	6.08	NS
Impulsivity	45.22	8.14	48.35	8.36	.05	47.16	8.77	47.56	8.29	NS
Nurturance	49.07	8.84	48.04	7.54	NS	51.13	7.77	47.31	8.32	NS
Order	55.87	8.86	51.58	10.11	.02	52.98	9.43	53.71	8.77	NS
Play	45.00	9.27	42.21	9.69	NS	46.53	9.90	41.37	8.4	.00
Sentience	47.93	8.97	46.68	10.71	NS	48.15	9.44	47.81	10.68	NS
Social Recognition	47.76	8.34	49.65	7.71	NS	49.85	8.57	48.53	7.45	NS
Succorance	48.48	9.14	49.00	8.34	NS	49.74	10.15	47.47	7.29	NS
Understanding	47.93	10.23	46.05	10.72	NS	47.98	11.18	43.85	10.45	.04
Infrequency	47.15	5.42	48.54	8.96	NS	47.50	5.62	48.41	9.11	NS
Desirability	56.44	11.08	47.88	11.37	.00	56.24	9.06	49.98	12.27	.00

group, t (109) = -4.25, p <.001; t (109) = -2.00, p .< .048 respectively.

Those women who scored higher on the measure of depressive affect also scored significantly lower on the subscales of affiliation, exibition, play and understanding, t (119) = 3.36, p < .001; t (119) = 2.32, p < .022; t (119) = 3.08, p <.003; t (119) = 2.10, p <. 038 respectively. This latter group scored significantly more highly on autonomy and cognitive structure than women in the low depressed group, t (119) = -2.05, p <.043 and t (119) = -2.24, p < .027 respectively.

Psychological functioning. Hotellings T^2, followed by multiple comparisons, was conducted on the set of measures completed by the women in their second trimester of pregnancy. The means, standard deviations, F and p values for these analyses are in Table 6. These analyses revealed that women who scored above the 75th percentile on measures of anxiety and depression scored significantly more highly on Trait anxiety, felt significantly less pleasure, less excitment and more stress during the second trimester than women who scored below the 25th percentile. Those who were anxious reported more stress and less social support to their Nurse Interviewer at this time. In addition, the highly anxious reported less positive social adjustment and a higher number of negative life events.

Women who were depressed at this time were significantly less aroused than the non-depressed group. They also reported significantly more stress to their Nurse Interviewer and less positive social adjustment. The means, standard deviations, F and p values for these

TABLE 6

Means and Standard Deviations of Psychological Measures Completed in Second Trimester of Pregnancy (20 Weeks)

	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
Measures	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Trait Anxiety	66	39.70	8.59	63	55.84	7.84	.000	71	42.38	9.61	67	53.61	9.71	.000
Mood	53			57				60			60			
Pleasure		2.95	0.80		0.70	1.55	.000		2.91	1.02		0.96	1.72	.000
Arousal		−0.46	0.93		−0.46	1.10	NS		0.04	0.96		−0.88	1.03	.000
Dominance		0.55	0.97		0.05	0.84	.004		0.55	1.08		−0.07	0.87	.001
Excitement		2.06	1.09		0.29	1.36	.000		2.48	1.01		0.17	1.37	.000
Stress		−2.92	0.97		−0.47	1.65	.000		−2.58	1.21		−0.75	1.72	.000

Hotellings T^2 $\underline{F}(6,103) = 24.079$

$p < .0000$

Low N = 53 High N = 57

Trait Anxiety	$p < .01$
Mood	
Pleasure	$p < .01$
Excitement	$p < .01$
Stress	$p < .01$

Hotellings T^2 $\underline{F}(6,113) = 20.553$

$p < .0000$

Low N = 60 High N = 60

Trait Anxiety	$p < .01$
Mood	
Pleasure	$p < .01$
Arousal	$p < .01$
Excitement	$p < .01$
Stress	$p < .01$

TABLE 7

Means and Standard Deviations of Social/Marital Measures Completed in Second Trimester of Pregnancy (20 Weeks)

	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
Measures	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Stress/Home	66	1.55	0.85	64	1.64	0.82	NS	71	1.56	0.82	68	1.69	0.83	NS
Stress	66	13.27	0.97	63	12.06	1.26	.000	71	13.17	0.93	67	12.43	1.31	.000
Social Support	66	8.06	1.16	63	8.95	1.34	.000	70	8.03	1.20	67	8.55	1.29	.015
Social Adjustment	66	1.55	0.20	64	1.96	0.33	.000	71	1.61	0.23	68	1.92	0.33	.000
Positive Life Events	61	1.92	1.31	57	2.25	1.77	NS	68	2.09	1.27	59	2.36	1.82	NS
Negative Life Events	61	0.43	0.83	57	1.63	1.96	.000	68	0.57	1.07	59	1.37	1.93	.004

Hotellings T^2 $F(6,123) = 18.279$

p∠.0000

Low N = 66 High N = 64

Stress	p∠.01
Social Support	p∠.05
Social Adjustment	p∠.01
Negative Life Events	p∠.01

Hotellings T^2 $F(6,132) - 7.9972$

p∠.0000

Low N = 71 High N = 68

Stress	p∠.05
Social Adjustment	p∠.01

analyses are in Table 7.

Maternal Attitudes. With respect to the attitude questionnaires completed during the second trimester, the univariate t-test analyses showed that the women in the more anxious and depressed groups were significantly more concerned regarding their pregnancy, $t\ (118) = 6.72$, $p < .001$ and $t\ (128) = 7.87$, $p < .001$ for anxiety and depression respectively, and regarding the impending birth of their baby, $t\ (118) = 3.37$, $p < .001$ and $t\ (128) = 2.67$, $p < .009$, for anxiety and depression respectively. See Table 8 for more complete information.

Prenatal period - third trimester

Psychological functioning. Hotellings T^2, followed by multiple comparisons, conducted on the set of measures completed at the 35th week of pregnancy, revealed that anxious and depressed women experienced significantly less excitement, felt significantly less dominant, and felt more stressed than the non-anxious and non-depressed women.

Anxious women rated themselves significantly lower than non-anxious women on self-esteem; depressed women rated themselves significantly less aroused than the non-depressed women. The means, standard deviations, F and p values for these data are in Table 9.

In addition, women in the high anxious groups reported significantly more stress to their Nurse Interviewer. Women in the high anxious and high depressed groups obtained significantly lower scores on the measure of marital adjustment than did the corresponding low groups of women.

TABLE 8

Means and Standard Deviations of Maternal Attitude Measures Completed at Each Time Point

Time Points & Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Prenatal														
Attitude re pregnancy	61	36.39	6.10	59	28.56	6.66	.000	66	37.83	5.50	64	29.25	6.88	.000
Worries re birth	61	18.39	4.25	59	15.69	4.52	.001	66	18.73	4.85	64	16.47	4.80	.009
Hospital														
Feelings re birth	56	22.84	5.54	52	19.37	5.06	.001	43	21.53	4.79	46	19.83	5.56	NS
Hospital Questionnaire														
Subscale 1	59	76.05	7.78	57	68.02	12.71	.000	46	74.87	7.29	52	65.40	13.31	.000
2		69.27	10.60		59.88	10.00	.000		66.63	11.69		61.13	11.14	.019
3		33.22	4.11		26.42	5.60	.000		30.93	4.99		27.33	6.26	.002
4		37.44	4.70		32.21	6.43	.000		34.93	5.72		32.44	5.89	.037
1 Week														
Change	59	28.95	3.95	60	24.12	5.38	.000	62	28.76	4.21	53	23.94	5.07	.000
Care	59	38.17	5.96	60	31.68	7.22	.000	62	38.21	6.62	53	33.23	7.55	.000
1 Month														
Change	69	21.74	3.57	55	17.54	3.91	.000	67	21.58	4.00	55	18.44	3.75	.000
Care	69	32.52	5.14	55	26.42	5.90	.000	67	31.99	6.12	55	26.70	6.15	.000
Hospital Follow-Up														
1	61	69.37	8.31	61	66.31	9.81	NS	65	70.43	8.81	60	65.98	9.26	.007
2		56.32	6.87		47.21	9.99	.000		56.57	7.98		49.17	10.16	.000
3		23.87	6.46		20.72	6.98	.009		24.17	6.04		20.90	7.15	.006
4		48.29	8.65		42.98	10.25	.002		49.03	7.81		43.97	10.29	.002
3 Months														
Change	74	36.26	6.05	62	29.11	6.39	.000	57	35.40	6.43	61	29.87	6.98	.000
6 Months														
Change	77	36.08	6.26	56	30.71	6.07	.000	48	36.04	6.54	53	31.11	5.34	.000
12 Months														
Change	61	37.52	5.93	48	30.13	5.70	.000	52	36.52	6.31	55	30.27	6.02	.000

TABLE 9

Means and Standard Deviations of Psychological Measures Completed in Third Trimester of Pregnancy (35 Weeks)

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Mood	62			59				58			61			
Pleasure		3.01	0.70		0.87	1.36	.000		2.94	0.68		0.58	1.26	.000
Arousal		-0.69	0.80		-0.51	1.07	NS		-0.04	0.90		-0.92	1.03	.000
Dominance		0.58	0.74		-0.14	0.69	.000		0.57	0.76		-0.15	0.77	.000
Excitement		2.17	0.87		0.33	1.39	.000		2.47	0.82		-0.04	1.20	.000
Stress		-2.98	0.64		-0.53	1.36	.000		-2.56	0.85		-0.45	1.28	.000
Self Esteem	61	4.20	0.73	58	3.51	0.74	.000		4.07	0.74		3.61	0.84	.002

Hotellings T^2 $F(6,114) = 31.792$

$p \angle .0001$

Low N = 62	High N = 59
Self Esteem	p∠.01
Pleasure	p∠.01
Dominance	p∠.01
Excitement	p∠.01
Stress	p∠.01

Hotellings T^2 $F(6,112) = 34.111$

$p \angle .0000$

Low N = 58	High N = 61
Pleasure	p∠.01
Arousal	p∠.01
Dominance	p∠.01
Excitement	p∠.01
Stress	p∠.01

TABLE 10

Means and Standard Deviations of Social/Marital Variables Completed in Third Trimester of Pregnancy (35 Weeks)

Variables	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Stress	61	13.48	0.67	56	12.86	1.10	.000	58	13.33	0.85	59	12.75	1.04	.001
Marital Adjustment	45	124.47	9.80	44	112.86	14.18	.000	45	123.09	11.96	37	114.19	16.04	.005

See Table 10 for the means, standard deviations, F and p values for these variables.

Maternal health during pregnancy. At the Initial Interview, the women rated their general health on a three point scale. Analysis using chi square technique indicated that significant relationship existed between depressive affect, anxiety and womens' rating of their health. Of the women who rated their health as poor, 77% were in the high anxiety group, $X^2(1) = 13.89$, $p < .0002$, while 63% of women who rated their general health as poor were in the high depression group, $X^2 (1) = 4.35$, $p < .04$.

Similarly, with ratings of mental health status, significant relationships between anxiety, depressive affect and rating of mental health were found, 91% of those rating their mental health as less than positive were in the high anxious group, $X^2 (1) = 16.51$, $p < .001$, while 73% of those rating their mental health negatively were in the depressed group, $X^2 (1) = 4.87$, $p < .027$.

Weight. There was no relationship between pregravid weight and levels of anxiety and depression at the Initial Interview. There was, however, a significant relationship between the psychological variables and weight gain up to the time of the Initial Interview. Women who had inappropriate weight gain, (slow gain or loss of weight), 66% were in the highly anxious group, $X^2 (1) = 7.30$, $p < .007$; while 61% of those with inappropriate weight gain were in the highly depressed group. $X^2 (1) = 4.54$ $p < .033$. At thirty-five weeks gestation similar findings were seen regarding anxiety. Of those with inappropriate weight gain, 61% were in the high anxious group, $\underline{X}^2$ (1) = 4.32, $\underline{p} <. 038$. The total weight gained by a woman during pregnancy was unrelated to her levels of anxiety or depressive affect during pregnancy.

Postpartum - Hospital

Hospital. Descriptive information relating to the obstetric and infant variables investigated in this study are outlined in Appendix N and Appendix O. The analyses of the hospital obstetric data, comparing the prenatal high/low anxiety and depression groups used t-tests. Women were compared on the following variables: length of gestation, length of labour (vaginal births only), number of days in hospital of the mother, Apgar at one and five minutes and birthweight of the baby. There were no significant differences between the groups on these variables. See Tables 11 and Table 11a for the means, standard deviations and $\underline{p}$ values of these data.

Chi square analyses were carried out to ascertain if there were any relationships between prenatal anxiety and depression assessed at 20 and 35 weeks gestation and anaesthesia, induction of labour, fetal monitoring, or type of birth. There was no association between psychological functioning and the obstetric variables, nor was there an association between maternal functioning and nursery placement of the infant.

Complications during labour and birth. Approximately 60% of the women had some type of complication during the birth (see Appendix N for more details). These women were compared on the prenatal and postpartum variables with women who had no complications. Analyses using t-tests indicated that there were no significant differences between the two groups in terms of their demographic status.

Women who had no complications during the birth (N=100) were compared with those who did have (N=99) with respect to personality characteristics and levels of stress and social support in the prenatal period. Those who had complications scored significantly higher on the personality subscale of Harmavoidance, $t(213) = 2.72$, $p < .007$. Women who had complications described themselves as cautious, apprehensive, unadventurous, and avoiders of bodily harm.

In the prenatal period there were no significant differences between the two groups on anxiety, depression, self-esteem, stress, social support, marital or social adjustment. Neither was there any difference with respect to number of negative life events. In addition, the two groups of women did not differ with respect to worries regarding the pregnancy or labour and birth.

Chi square analyses were conducted to ascertain whether the psychological functioning of the women in the prenatal period was related to complications in the birth process, see Appendix N for details. There was no relationship between levels of anxiety or depression at 35 weeks gestation and presence/absence of complications during labour and birth. Nor was there any relationship between type of complication at birth and anxiety or depression in the immediate postpartum period.

There was no relationship between induction of labour and depression or anxiety in the immediate postpartum period. While there was no relationship between fetal monitoring and depression, 60% of women who had fetal monitoring were in the highly anxious group after the birth, $\underline{X}^2$ (3) = 8.69, $\underline{p}$ <.034.

In the postpartum period, there were no significant differences on any of the psychological variables, e.g. anxiety, depression, marital adjustment, self-esteem. The women who had no complications had a more positive attitude towards the labour and birth in hospital, $\underline{t}(201) = -2.62$, $\underline{p} <.009$, and at the one month followup, $\underline{t}(234) = -4.70$, $\underline{p} <.001$.

Psychological functioning. Hotellings $\underline{T}^2$ followed by multiple comparisons, conducted on the mood variables completed in hospital indicated that those in the high anxious, high depressed groups felt significantly less pleasure, less excitement and more stress during their hospital stay. See Table 12 for relevant details.

Maternal attitudes. The responses of the women to the attitude questionnaires completed in hospital, relating to the birth experience, hospital experience were compared using t-tests.

Labour and birth experience. With respect to attitudes towards labour, the anxious women felt significantly less positive about their labour and birth experience, $\underline{t}$ (106) = 3.40, $\underline{p}$ <.001, than the nonanxious group. There was no significant difference between the depressed and non-depressed group.

Both the anxious and depressed groups had significantly lower scores than the nonanxious and nondepressed groups on the Hospital Questionnaire subscales: satisfaction with hospital experience, $\underline{t}$ (114) = 4.12, $\underline{p}$ < .001 (anxiety), $\underline{t}$ (96) = 4.29,

$\underline{p} < .001$ (depression), labour and birth experience, $\underline{t}$ (114) = 4.91, $\underline{p} < .001$ (anxiety), $\underline{t}$ (96) = 2.38, $\underline{p} < .019$ (depression); confidence concerning mothering role, $\underline{t}$ (114) = 7.48, $\underline{p} < .001$ (anxiety), $\underline{t}$ (96) = 3.13, $\underline{p} < .002$ (depression); preparation for mothering role, $\underline{t}$ (114) = 5.01, $\underline{p} < .001$ (anxiety) , $\underline{t}$ (96) = 2.12, $\underline{p} < .037$ (depression). See Table 8 for means and standard deviations of these variables.

A greater proportion of women who were anxious and depressed rated their labour as difficult; 80% of women in the anxious group, $\underline{X}^2$ (1) = 4.26, $\underline{p} < .039$; 75% of women in the depressed group $\underline{X}^2$ (1) = 5.00, $\underline{p} < .025$. There was no relationship between anxiety and depression and rating of the duration of labour and birth as long or short. In addition, a higher proportion of the anxious women felt more negative about the birth of their baby, $\underline{X}^2$ (2) = 10.50, $\underline{p} < .005$.

There was no relationship between anxiety and depression and maternal responses to questions relating to holding the baby, breastfeeding the baby, presence of husband/partner for the birth, but there was a significant relationship between development of feeling towards the baby and anxiety and depression. Those in the anxious and depressed groups reported that they took longer to feel close to the baby, $\underline{X}^2$ (1) = 8.63, $\underline{p} < .003$ and $\underline{X}^2$ (1) = 4.44, $\underline{p} < .035$ respectively. Of the women who reported that it took three days or more to feel close to their infant, 74% were in the depressed group and 78% in the anxious group.

TABLE 11

Psychological Functioning Measured in Second Trimester of Pregnancy (20 Weeks) as it Relates to Obstetrical Outcomes

	Low Anxiety			High Anxiety			Low Depression			High Depression		
Variables	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD
Length of gestation	60	39.88	1.64	59	39.85	1.60	68	39.96	1.77	61	39.82	1.52
Length of labor (vaginals only)												
1st stage (hours)	48	9.28	4.83	48	9.30	5.71	58	11.46	6.84	50	9.80	5.27
2nd stage (minutes)	48	67.23	38.53	46	65.61	38.01	55	74.18	40.56	48	63.25	36.93
Total length of labor (hours)	48	10.38	5.08	46	10.51	5.75	55	12.73	7.03	48	10.74	5.31
Birthweight (grams)	64	3509.70	509.21	60	3449.15	598.90	69	3594.09	572.87	65	3470.15	530.19
Apgar at 1 minute	60	7.95	1.63	58	8.10	1.63	68	7.71	1.89	60	8.32	1.43
Apgar at 5 minutes	60	9.22	.99	58	9.33	.87	68	9.22	.73	60	9.38	.72
Number of days in hospital - infant	60	5.65	1.97	59	6.25	4.90	68	5.81	2.66	60	6.03	4.84
Number of days in hospital - mother	60	5.63	1.53	59	7.03	6.92	68	5.84	1.60	60	6.90	6.89

* none of the above comparisons is statistically significant

TABLE 11a

Psychological Functioning Measured in Third Trimester of Pregnancy (35 Weeks) as it Relates to Obstetrical Outcomes

	Low Anxiety			High Anxiety			Low Depression			High Depression		
Variables	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD
Length of gestation	59	40.09	1.62	56	40.02	1.48	54	39.91	1.40	58	40.05	1.62
Length of labor (vaginals only)												
1st stage (hours)	50	10.34	5.24	45	9.00	5.57	47	11.57	7.44	45	9.58	4.67
2nd stage (minutes)	49	72.78	42.41	42	63.64	37.10	46	70.00	35.65	43	69.28	38.74
Total length of labor (hours)	49	11.32	4.97	44	9.90	5.51	46	12.80	7.55	45	10.96	5.16
Birthweight (grams)	64	3577.36	543.74	57	3454.49	487.05	58	3443.78	558.50	60	3550.22	501.87
Apgar at 1 minute	59	7.83	1.93	56	8.00	1.70	54	8.04	1.68	58	8.10	1.67
Apgar at 5 minutes	59	9.14	1.07	56	9.41	.75	54	9.30	.72	58	9.38	.77
Number of days in hospital - infant	59	5.34	1.78	55	5.29	1.61	54	5.76	5.00	58	5.38	1.73
Number of days in hospital - mother	59	6.20	4.88	55	6.06	2.92	54	6.33	5.46	58	5.85	1.92

* none of the above comparisons is statistically significant

TABLE 12

Means and Standard Deviations of Psychological Measures Completed in Hospital

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\overline{X}$	SD	N	$\overline{X}$	SD		N	$\overline{X}$	SD	N	$\overline{X}$	SD	
Mood	57			53				47			49			
Pleasure		3.41	0.69		1.38	1.35	.000		2.97	1.00		1.43	1.57	.000
Arousal		-0.27	0.94		-0.04	1.11	NS		0.13	1.12		-0.27	1.11	NS
Dominance		0.53	0.94		-0.49	0.91	.000		0.20	0.95		-0.29	0.99	.016
Excitement		2.87	1.02		0.89	1.38	.000		2.67	1.01		0.75	1.55	.000
Stress		-3.10	0.93		-0.11	1.16	.000		-2.40	1.34		-0.67	1.58	.000

Hotellings T^2 $F(5,104) = 49.114$

$p \angle .000$

Low N = 57	High N = 53
Pleasure	$p \angle .01$
Dominance	$p \angle .01$
Excitement	$p \angle .01$
Stress	$p \angle .01$

Hotellings T^2 $F(5,90) = 12.39$

$p \angle .000$

Low N = 47	High N = 49
Pleasure	$p \angle .01$
Excitement	$p \angle .01$
Stress	$p \angle .01$

Postpartum - One Week Postdischarge

Psychological functioning. Hotellings T^2, followed by multiple comparisons, conducted on the set of psychological measures completed by the women after they had been at home for one week, revealed that both groups experienced less pleasure, felt less dominant, less excited and more stressed than the non-anxious, non-depressed groups. See Table 13 for the relevant means, standard deviations, F and p values.

Maternal attitudes. The results of the univariate t-test analyses indicated that when the more anxious mothers had been home for one week they had significantly lower scores on the attitude towards lifestyle change scale, $t\ (117) = 5.58$, $p <.001$, and felt significantly less confident in caring for their baby, $t\ (117) = 5.34$, $p <.001$. The depressed group also had significantly lower scores on the attitude towards lifestyle change scale, $t(113) = 5.57$, $p <.001$, and confidence in caring for their baby, $t(112) = 3.76$, $p <.001$. See Table 8 for the relevant information.

Postpartum - One Month

Psychological functioning. Hotellings T^2, followed by multiple comparisons, was conducted on the two sets of psychological measures completed at one month. These analyses indicated that although there was a significant difference between the highly anxious and the non-anxious women regarding level of self-esteem, there was no significant difference between the high/low depressed groups. Both groups who scored highly on anxiety and depression reported significantly less pleasure, less dominance, less excitement

TABLE 13

Means and Standard Deviations of Psychological Measures Completed at 1 Week Postdischarge

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Mood	54			55				59			48			
Pleasure		3.25	0.77		0.84	1.46	.000		3.13	0.77		0.73	1.55	.000
Arousal		-0.38	0.83		-0.08	0.96	NS		-0.23	0.88		-0.62	1.07	.040
Dominance		0.64	1.00		-0.38	0.98	.000		0.60	1.14		-0.55	0.92	.000
Excitement		2.43	1.18		0.26	1.57	.000		2.53	1.08		-0.22	1.48	.000
Stress		-2.97	1.06		0.08	1.44	.000		-2.76	1.14		0.02	1.54	.000

Hotellings T^2 *F*(5,103) = 32.24		Hotellings T^2 *F*(5,101) = 34.34	
$p \angle .000$		$p \angle .000$	
Low N = 54	High N = 55	Low N = 59	High N = 48
Pleasure	$p \angle .01$	Pleasure	$p \angle .01$
Dominance	$p \angle .01$	Dominance	$p \angle .01$
Excitement	$p \angle .01$	Excitement	$p \angle .01$
Stress	$p \angle .01$	Stress	$p \angle .01$

and significantly more stress at this time period. Those in the high anxious group also reported significantly more negative life events. There was no significant difference between the groups in terms of positive life events or in terms of perceived amount of social support. See Tables 14 and 15 for the means and standard deviations, as well as F, *t* and *p* values.

Maternal attitudes. With respect to maternal attitudes at one month, analyses using t-tests revealed that women in the highly anxious and depressed groups were significantly less positive regarding their life style change, *t* (123) = 6.28, p < .001; and *t* (120) = 4.45, *p* <.001 respectively. They also felt significantly less positive regarding confidence in caregiving, *t* (122) = 6.15, *p* <.001 and *t* (119) = 4.71, p. <.001 respectively.

Both the highly anxious and depressed groups responded less positively on the Hospital Follow-up subscales, as follows: satisfaction with hospital experience, *t* (111) = 3.19, *p* <.002, (anxiety), *t* (94) = 3.34, *p* < .001, (depression); confidence concerning mothering role, *t* (111) = 4.72, *p* <.001 (anxiety), *t* (94) = 2.35, *p* <.021 (depression); control over labour and birth, *t* (111) = 3.73, p < .001 (anxiety), *t* (94) = 2.60, *p* < .011 (depression); and satisfaction with experience on postpartum unit, *t* (111) = 4.93, *p* < .001 (anxiety), *t* (94) = 3.94, *p* <.001 (depression). The relevant data are in Table 8.

Maternal problems. There was a significant relationship between postpartum problems and anxiety as reported by the mother; 60% of those in the high anxious group had postpartum problems, $\underline{X}^2$ (1) = 4.49, $\underline{p}$ <.034. There was, however, no relationship between postpartum problems at one month and depressive affect.

Infant feeding. The majority (95%) of women left hospital breastfeeding their baby. At one month postpartum there was no relationship between anxiety and method of feeding or problems with infant feeding. There was, however, a significant relationship between level of depression and method of feeding. Only 58% of the depressed group were breastfeeding, whereas 80% of the non-depressed group were breastfeeding, $\underline{X}^2$ (2) = 8.46, $p < .01$. Similarly, problems with infant feeding at one month were related to depression, $\underline{X}^2$ (1) = 5.54, $\underline{p}$ = <.019, 66% of those women who had problems were in the depressed group.

Illness of infant. There was no relationship between anxiety and depression and illness of the infant at one month.

Postpartum - Three Months

Psychological functioning. At the three month follow-up period, Hotellings $\underline{T}^2$ analyses, followed by multiple comparisons, were conducted on the set of psychological measures. At this time it was found that those with high scores on measures of anxiety and depression: obtained significantly lower scores on the measure of marital and social adjustment, and reported significantly less pleasure, less excitement and more stress on the mood scale. Both groups reported significantly more stress to their Nurse Interviewer at the three month visit. Those in the anxious group had significantly lower scores on the measures of self-esteem. See Tables 16 and 17 for the means, standard deviations, t, $\underline{F}$ and $\underline{p}$ values.

TABLE 14

Means and Standard Deviations of Psychological Measures Completed at 1 Month Postpartum

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Self Esteem	66	4.31	0.62	60	3.92	0.58	.000	63	4.34	0.63	59	3.96	0.61	.001
Mood	69			60				67			59			
Pleasure		3.08	0.83		0.92	1.38	.000		2.98	0.77		0.77	1.45	.000
Arousal		-0.45	0.75		-0.31	0.75	NS		-0.10	0.79		-0.58	0.86	.002
Dominance		0.77	0.82		-0.29	0.93	.000		0.76	0.89		-0.13	0.88	.000
Excitement		2.25	1.00		0.24	1.34	.000		2.40	0.90		0.01	1.30	.000
Stress		-2.71	1.35		-0.18	1.42	.000		-2.41	1.10		-0.23	1.52	.000

Hotellings T^2 $\underline{F}(6,122) = 26.151$		Hotellings T^2 $\underline{F}(6,119) = 29.625$	
p ∠ .0000		p ∠ .0000	
Low N = 69	High N = 60	Low N = 67	High N = 59
Pleasure	p∠.01	Pleasure	p∠.01
Dominance	p∠.01	Dominance	p∠.01
Excitement	p∠.01	Excitement	p∠.01
Stress	p∠.01	Stress	p∠.01
Self Esteem	p∠.05		

TABLE 15

Means and Standard Deviations of Social/Marital Variables Completed at 1 Month Postpartum

Variables	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Stress	68	13.26	0.84	61	12.30	1.63	.000	68	13.07	1.07	59	12.25	1.58	.002
Social Support	69	7.67	1.33	59	8.15	1.30	.039	68	7.65	1.16	58	8.26	1.37	.008
Positive Life Events	69	3.13	1.54	63	2.89	1.48	NS	68	3.19	1.80	62	3.02	2.24	NS
Negative Life Events	69	0.42	0.76	63	1.56	1.75	.000	68	0.79	1.36	62	1.56	1.67	.004

Hotellings T^2 $F(4,128) = 8.5046$
p ∠ .0000
Low N = 70 High N = 63
Stress p∠.01
Negative Life Events p∠.01

Hotellings T^2 $F(4,126) = 5.4835$
p ∠ .0004
Low N = 69 High N = 62
Stress p∠.05

TABLE 16

Means and Standard Deviations of Psychological Measures Completed at 3 Months Postpartum

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Mood	73			65				57			63			
Pleasure		3.12	0.70		0.90	1.20	.000		2.97	0.81		0.96	1.31	.000
Arousal		-0.24	0.95		-0.08	1.03	NS		-0.00	0.82		-0.39	0.95	.018
Dominance		0.82	1.03		0.27	1.05	.002		0.81	1.02		0.22	1.01	.002
Excitement		2.53	0.99		0.40	1.20	.000		2.45	0.99		0.34	1.24	.000
Stress		-3.01	0.71		-0.26	1.38	.000		-2.65	1.02		-0.69	1.60	.000
Self Esteem	74	4.49	0.38	63	3.97	0.58	.000	57	4.40	0.48	62	4.17	0.55	.019

Hotellings T^2 $F(6,131) = 51.635$
p∠ .0000

Low N = 73	High N = 65
Pleasure	p∠.01
Excitement	p∠.01
Stress	p∠.01
Self Esteem	p∠.01

Hotellings T^2 $F(6,113) = 18.455$
p ∠ .0000

Low N = 57	High N = 63
Pleasure	p∠.01
Excitement	p∠.01
Stress	p∠.01

TABLE 17

Means and Standard Deviations of Social/Marital Variables Completed at 3 Months Postpartum

Variables	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\overline{X}$	SD	N	$\overline{X}$	SD		N	$\overline{X}$	SD	N	$\overline{X}$	SD	
Stress	72	13.22	1.25	61	12.30	1.61	.000	57	13.25	1.06	59	12.12	1.61	.000
Social Support	72	7.33	1.10	62	7.66	1.32	NS	57	7.25	1.02	60	7.78	1.26	.013
Marital Adjustment	73	123.49	10.75	60	113.17	13.96	.000	58	121.09	12.64	59	112.75	14.33	.001
Social Adjustment	75	1.65	0.23	64	2.04	0.34	.000	58	1.72	0.24	62	2.02	0.35	.000

Hotellings T^2 $F(4,116) = 11.31$
$p \angle .000$

Low N = 75	High N = 64
Stress	$p \angle .01$
Marital Adjustment	$p \angle .05$
Social Adjustment	$p \angle .01$

Hotellings T^2 $F(4,134) = 18.10$
$p \angle .000$

Low N = 58	High N = 63
Stress	$p \angle .01$
Marital Adjustment	$p \angle .01$
Social Adjustment	$p \angle .01$

Maternal attitudes. T-tests were conducted on the attitude questionnaires completed at this time. The women in both groups had significantly less positive attitude to their lifestyle changes at this time period, $\underline{t}$ (134) = 6.68, $p < .001$ (anxiety) and $\underline{t}$ (116) = 4.47, $\underline{p} < .001$ (depression). See Table 8 for the relevant means and standard deviations.

Maternal problems. At three months postpartum, a significant relationship existed between both anxiety and depression and maternal postpartum problems. In each case a higher proportion of women in both the depressed group (64%) and the anxious group (64%) reported to their Nurse Interviewers that they were having problems at this time, $\underline{X}^2$ (1) = 8.98, $\underline{p} < .003$ (anxiety); $\underline{X}^2$ (1)= 4.25, $\underline{p} < .039$ (depression).

Feeding and Illness. At three months there was no relationship between anxiety and depression and method of feeding nor with problems in feeding or illness of infant.

Postpartum - six months

Psychological functioning. Hotellings $\underline{T}^2$ analyses, followed by multiple comparisons were carried out on the set of psychological measures.

There were significant differences in scores obtained on measures of stress, negative life events and social adjustment by those in the anxious group. Both the high anxiety and high depressed group had significantly less pleasure, excitement and significantly more stress at six months. In addition, the more anxious woman had less positive self-esteem than the non-anxious, and the depressed group was significantly was significantly lower on the measure of arousal. See Tables 18 and 19 for the means and standard deviations, F and p values of these measures.

Maternal attitudes. Inspection of Table 7 reveals that at the six month follow-up, those women who are depressed and anxious have a significantly lower score relating to attitudes regarding lifestyle changes, $t\ (131) = 4.94$, $p <.001$; $t\ (99) = 4.16$, $p < .001$ for anxiety and depression respectively.

Maternal problems There was no relationship between maternal postpartum problems and either anxiety or depression at the six month period.

Feeding and illness. There was no relationship between level of psychological functioning and either method of infant feeding or problems with feeding or illness of infant.

Infant temperament. When the babies were six months of age, the women completed the Carey Infant Temperament Survey. Based on the responses of the mother the babies were categorised as follows: 12.4% infants were placed in the difficult category; 46.8% were placed the intermediate category; 4.7% in the slow-to-warm-up category and 36.1% infants were placed in the easy category. There was no relationship between mothers perception of her infant's temperament and her level of depression. However, 62% of those babies in the difficult category had mothers in the high anxious group, $X^2\ (1) = 5.55$, $p <.02$. See Appendix Q.

TABLE 18

Means and Standard Deviations of Psychological Measures Completed at 6 Months Postpartum

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Mood	79			59				49			56			
Pleasure		3.06	0.74		0.53	1.20	.000		3.05	0.64		0.58	1.23	.000
Arousal		-0.17	0.83		-0.44	1.11	NS		0.11	0.77		-0.82	0.81	.000
Dominance		0.86	1.06		0.31	0.94	.002		0.79	0.99		0.24	0.89	.003
Excitement		2.30	0.86		0.09	1.32	.000		2.46	0.95		-0.03	1.19	.000
Stress		-2.89	0.82		-0.08	1.09	.000		-2.68	0.97		-0.53	1.23	.000
Self Esteem	78	4.48	0.37	59	3.91	0.65	.000	47	4.40	0.40	54	4.16	0.60	.020

Hotellings T^2	$\underline{F}(6,131) = 60.263$	Hotellings T^2	$\underline{F}(6,98) = 31.268$
p .0000		p .0000	
Low N = 79	High N = 59	Low N = 49	High N = 56
Pleasure	p .01	Pleasure	p .01
Excitement	p .01	Arousal	p .01
Stress	p .01	Excitement	p .01
Self Esteem	p .01	Stress	p .01

TABLE 19

Means and Standard Deviations of Social/Marital Variables
Completed at 6 Months Postpartum

Variables	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Stress	75	13.09	1.19	57	12.11	1.64	.000	46	12.98	1.20	53	12.34	1.57	.027
Social Support	75	7.37	1.11	57	7.84	1.57	.047	46	7.37	1.20	53	7.47	1.33	NS
Social Adjustment	78	1.62	0.22	55	1.97	0.34	.000	48	1.68	0.28	53	1.86	0.30	.002
Positive Life Events	79	1.16	1.23	59	1.27	1.44	NS	49	1.02	1.01	55	1.25	1.35	NS
Negative Life Events	79	0.49	1.00	59	1.47	1.80	.000	49	0.39	0.84	55	1.24	1.76	.003

Hotellings T^2 F(5,132) = 12.94
p ∠ .0000

Low N = 79	High N = 59
Stress	p∠.01
Negative Life Events	p∠.01
Social Adjustment	p∠.01

Hotellings T^2 F(5,99) = 3.58
p ∠ .006

Low N = 49 High N = 56

Postpartum - Twelve Months.

Psychological functioning. Hotellings $\underline{T}^2$ analyses, followed by multiple comparisons, conducted on the set of psychological measures completed at the twelve month follow-up revealed that there were significant differences between the women in the low and high anxious and the women in the low and high depressed groups. See Table 20 for the means and standard deviations of these measures.

On the mood subscales the high anxious and high depressed groups were significantly less excited, experienced less pleasure and significantly more stress than the corresponding women in the two low groups. In addition, the women in the anxious and depressed group had significantly lower scores on the measure of social adjustment. At this time, women in the high anxious and depressed groups reported to the Nurse Interviewer that they were more stressed.

Women in the high anxious group reported significantly more negative life events and lowered self-esteem. Women in the depressed group had a significantly less positive marital adjustment. See Table 21 for the means and standard deviations of these measures.

The women completed additional measures of depression, the Beck Depression Index and Depression Score, at six and twelve months postpartum. There was a significant difference between the high and low anxiety and high and low depressed groups on these measures. Women scoring highly on anxiety and depression scored more highly than the low groups. See Table 22 for the means and standard deviations and p values for these data.

Maternal attitudes. Analyses using t-tests revealed that there was a significant difference between the two groups of women and their attitude towards lifestyle change. Those in the high anxious and high depressed groups had significantly less positive attitudes towards the lifestyle change, t (107) = 6.58, $p < .001$ (anxiety) and t (105)= =5.24, $p < .001$ (depression). These data are outlined in Table 8.

At twelve months, the women were asked how stressful they found the past year. Those in the high anxious and depressed groups reported a significantly higher level of stress since the birth of the baby than did non-anxious and non-depressed groups, $t(108) = 2.20$, $p <.03$ (depression) and $t(108) = 3.40$, $p <.001$ (anxiety).

Maternal problems. At the twelve month followup, a significant relationship existed between anxiety and maternal problems, 66% of women who had problems were in the highly anxious group. X^2 (1) = 5.34, $p <.021$.

The majority, (nine out of ten), of those women no longer living with their partner at twelve months, were in the depressed category, X^2 (1) = 4.35, $p <.037$.

Feeding. At the twelve month period there was a significant relationship between type of feeding and both anxiety and depression. A greater proportion of women in the high groups bottlefed their baby compared to those in the low anxious/depressed groups, $X^2(3) = 8.57$, $p < .04$ (anxiety), X^2 (3) = 10.94, $p <.01$ (depression). There was no relationship between problems with feeding and anxiety

TABLE 20

Means and Standard Deviations of Psychological Measures Completed at 12 Months Postpartum

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Mood	61			50				51			59			
Pleasure		2.94	0.76		0.22	1.61	.000		2.97	0.81		0.53	1.68	.000
Arousal		-0.33	1.06		-0.12	1.15	NS		0.04	0.88		-0.58	1.10	.002
Dominance		0.87	1.08		0.25	1.05	.003		0.98	1.10		0.16	0.94	.000
Excitement		2.21	0.91		-0.14	1.55	.000		2.41	0.96		-0.10	1.47	.000
Stress		-2.86	0.87		0.18	1.58	.000		-2.64	1.02		-0.42	1.80	.000
Self Esteem	59	4.28	0.71	48	3.65	0.79	.000	49	4.18	0.73	58	3.70	0.86	.003

Hotellings T^2 $F(6,104) = 31.335$
p ∠ .0000

Low N = 61	High N = 50
Pleasure	p∠.01
Excitement	p∠.01
Stress	p∠.01
Self Esteem	p∠.01

Hotellings T^2 $F(6,103) = 18.749$
p ∠ .0000

Low N = 51	High N = 59
Pleasure	p∠.01
Excitement	p∠.01
Stress	p∠.01

TABLE 21

Means and Standard Deviations of Social/Marital Variables Completed at 12 Months Postpartum

Variables	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\overline{X}$	SD	N	$\overline{X}$	SD		N	$\overline{X}$	SD	N	$\overline{X}$	SD	
Stress	60	13.10	1.05	50	11.88	1.55	.000	51	13.00	1.02	59	12.12	1.27	.000
Social Support	59	7.12	1.19	50	7.42	1.44	NS	51	7.06	1.21	58	7.24	1.42	NS
Social Adjustment	60	1.65	0.24	50	2.01	0.43	.000	52	1.67	0.27	59	1.99	0.41	.000
Marital Adjustment	54	121.07	12.47	46	106.74	16.90	.000	51	120.10	13.16	51	107.65	17.33	.000
Positive Life Events	61	0.95	1.64	50	1.34	1.45	NS	52	1.31	1.46	58	1.14	1.29	NS
Negative Life Events	61	0.48	0.96	50	1.86	1.91	.000	52	0.63	1.16	58	1.62	1.84	.001

Hotellings T^2 $\underline{F}(6,104) = 11.039$

p ∠.0000

Low N = 61	High N = 50
Stress	p∠.01
Social Adjustment	p∠.01
Negative Life Events	p∠.01

Hotellings T^2 $\underline{F}(6,104) = 7.4753$

p∠ .0000

Low N = 52	High N = 59
Stress	p∠.01
Social Adjustment	p∠.01
Marital Adjustment	p∠.05

TABLE 22

Means and Standard Deviations of Psychological Functioning Obtained Throughout the Postpartum Period

	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Beck														
6 Months	43	2.72	2.45	40	7.70	4.79	.000	26	4.04	4.80	39	7.03	5.83	.034
12 Months	58	3.09	3.41	46	6.41	5.18	.000	51	2.92	2.56	55	7.20	5.66	.000
Depression Score														
3 Months	68	13.40	4.81	61	24.95	7.46	.000	51	15.51	5.58	59	23.69	8.02	.000
6 Months	78	13.54	5.85	57	24.72	7.80	.000	49	14.84	6.67	55	23.00	8.42	.000
12 Months	61	14.03	5.56	49	25.45	8.24	.000	52	13.19	5.41	58	23.53	7.68	.000

or depression.

Illness of infant. There was no relationship between the psychological states and illness of infant at this time.

Assessment of Infant Development

The results of the infant assessments, namely, Bayley Scales and the Strange Situation are outlined in Appendix Q.

The scores achieved by the babies on the Bayley Scales of Infant Development did not differ according to whether their mother was in the high anxious or high depressed group. The means and standard deviations for these scales are in Appendix R.

The dimension of secure/anxious attachment as measured by the Strange Situation was unrelated to the level of maternal psychological functioning at twelve months.

Assessment of Psychological Functioning over Time

Analysis of variance and covariance repeated measures was conducted on the following psychological measures completed at the different time points: anxiety, depression, mood (arousal, pleasure, dominance, stress, excitement), and general self-esteem. The means and standard deviations are to be found in Table 23. If a significant F ratio was found, the analysis was followed by three multiple comparisons, chosen a priori, using the Scheffe procedure.

The choice of time periods for comparison stems from the empirical literature of pregnancy and childbirth. Most researchers have investigated the changes in psychological functioning on the third or fourth day postpartum, therefore it seemed appropriate to compare psychological functioning in the hospital with all other time points. It also seemed appropriate to compare psychological functioning before the birth with psychological functioning immediately after the birth. The question of stability of psychological functioning of childbearing women from pregnancy through the first year postpartum has not been resolved satisfactorily. Therefore, the third comparison compared prenatal with postpartum functioning.

First, measures completed before the birth were compared with those completed after the birth. Second, measures completed in hospital were compared with those completed at all other time points. Third, the 35 week gestation point, the hospital data point and the one week data point were compared. These analyses will be discussed in turn. See Figures 1 to 6.

Anxiety. Analysis of variance revealed that there was a significant difference in the level of anxiety over time, F (7,1162) = p < 001. The three multiple comparisons, however, were not significant. Figure 1 shows the relationship between time of measurement and level of anxiety.

Depression. There was a significant difference in level of depressive affect over the duration of the study, F (7,1113) = 14.08, $p < .01$. Subsequent analysis showed that there was no significant difference between the combined means of the prenatal period when compared with the postpartum period. There was no significant difference between the mean level of depressive affect in hospital when compared to the average of the means at all other time points, although the level of depressive affect in hospital was significantly higher than either the 35 week time point or the one week time point.

TABLE 23

Means and Standard Deviations for Psychological Measures Completed Throughout Childbearing Year

		Anxiety	Depression	Mood					Soc Adj	Self Esteem
		M/Fa	M/Fa	Pleasure M/Fa	Arousal M/Fa	Dominance M/Fa	Excitement M/Fa	Stress M/Fa	M	M
	N	167/126	160/127	135/96	135/96	135/96	135/96	135/96	203	179
Initial Interview	$\bar{X}$	44.55/46.15	47.18/46.31	2.18/2.01	-0.37/0.08	0.44/1.03	1.43/1.44	-1.88/-1.66	1.72	-
	SD	10.04/11.76	8.29/ 6.79	1.34/1.10	1.02/0.97	0.89/1.04	1.37/1.11	1.42/ 1.37	0.28	-
35 Weeks	$\bar{X}$	45.24/45.29	46.38/44.92	2.18/1.95	-0.53/0.11	0.33/0.96	1.50/1.47	-1.89/-1.51	-	3.92
	SD	10.78/10.84	7.62/ 8.72	1.25/1.34	1.04/0.91	0.87/1.02	1.24/1.18	1.28/ 1.35	-	0.77
In Hospital	$\bar{X}$	46.36/ -	52.19/ -	2.41/ -	-0.23/ -	0.03/ -	1.88/ -	-1.77/ -	-	-
	SD	10.82/ -	8.28/ -	1.33/ -	1.03/ -	1.05/ -	1.45/ -	1.54/ -	-	-
1 Week	$\bar{X}$	47.36/45.71	49.98/45.91	2.08/2.05	-0.43/0.15	0.20/1.09	1.30/1.63	-1.47/-1.60	-	-
	SD	12.33/10.98	7.71/ 7.16	1.47/1.20	0.92/0.96	1.04/1.05	1.51/1.30	1.74/ 1.26	-	-
1 Month	$\bar{X}$	43.84/44.53	47.43/45.23	2.17/2.16	-0.37/-0.04	0.38/1.10	1.34/1.71	-1.65/-1.64	-	4.12
	SD	11.89/12.26	8.06/ 8.30	1.38/1.21	0.91/ 0.95	1.06/1.19	1.40/1.30	1.71/ 1.53	-	0.63
3 Months	$\bar{X}$	42.61/44.24	46.39/44.24	2.18/1.96	-0.23/ 0.18	0.52/1.02	1.52/1.64	-1.83/-1.58	1.84	4.23
	SD	11.11/11.50	6.59/ 6.61	1.26/1.14	0.96/ 0.87	1.03/1.06	1.32/1.13	1.43/ 1.25	0.32	0.51
6 Months	$\bar{X}$	43.37/46.18	48.80/47.43	2.04/1.75	-0.42/-0.06	0.56/0.98	1.31/1.18	-1.81/-1.43	1.76	4.25
	SD	10.91/11.38	7.41/ 7.45	1.35/1.24	0.86/ 0.95	0.97/1.07	1.32/1.38	1.41/ 1.39	0.29	0.51
12 Months	$\bar{X}$	44.13/46.14	48.68/48.74	2.03/1.91	-0.24/ 0.06	0.62/1.10	1.34/1.41	-1.67/-1.46	1.79	4.06
	SD	12.04/11.64	8.11/ 7.23	1.46/1.13	1.06/ 1.09	1.09/1.04	1.40/1.27	1.64/ 1.34	0.32	0.75
	p	.0001/ NS	.01/ .01	NS / NS	.024/ NS	.024 / NS	.0005/.002	NS / NS	.01	.01

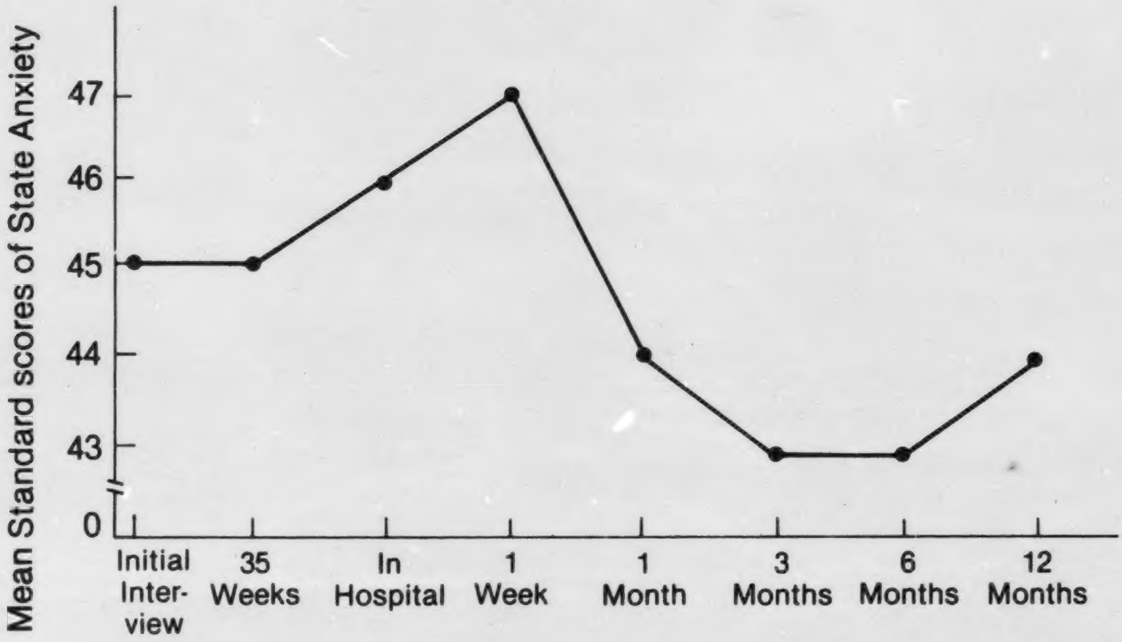

Figure 1: Level of Psychological Functioning During Pregnancy and One Year Postpartum - State Anxiety (N=160)

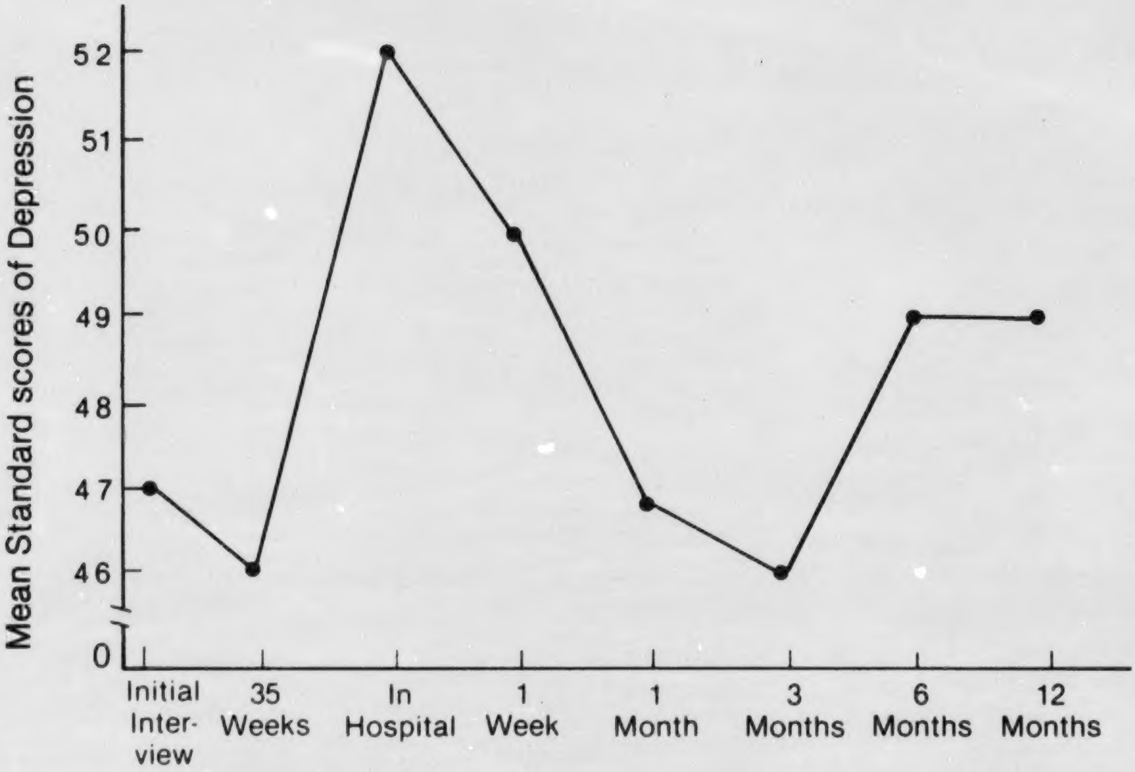

Figure 2: Level of Psychological Functioning During Pregnancy and One Year Postpartum - Depression (N =167)

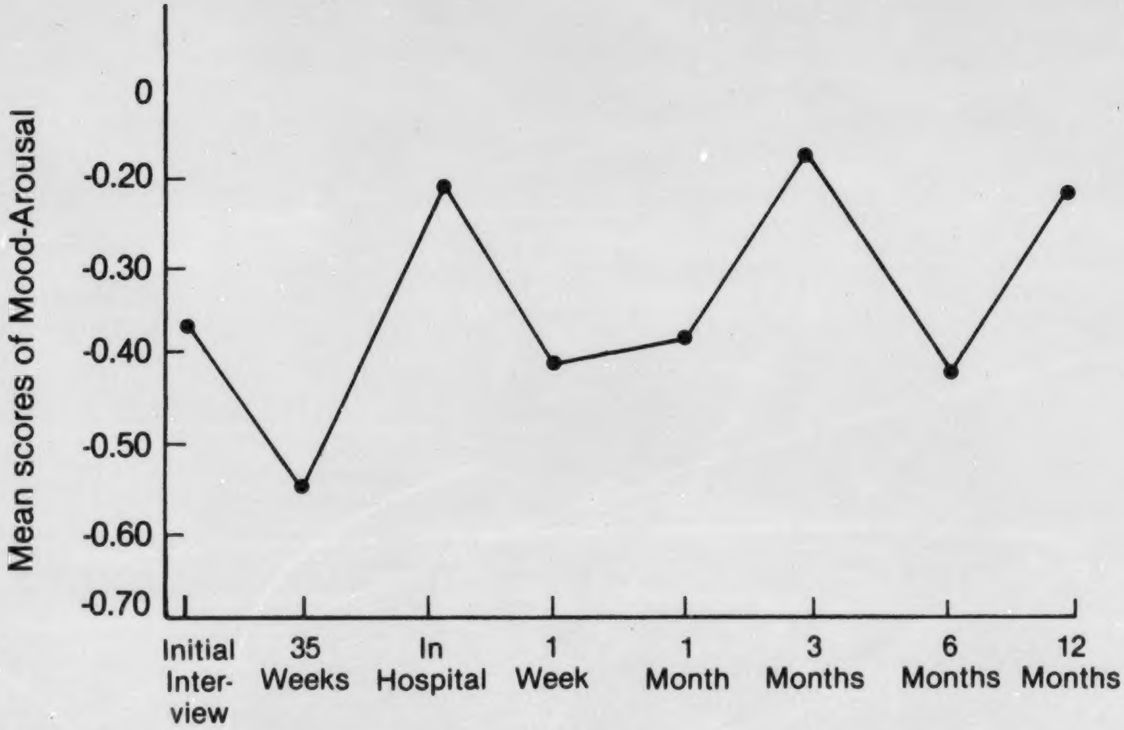

Figure 3: Level of Psychological Functioning During Pregnancy and One Year Postpartum - Mood-Arousal (N=135)

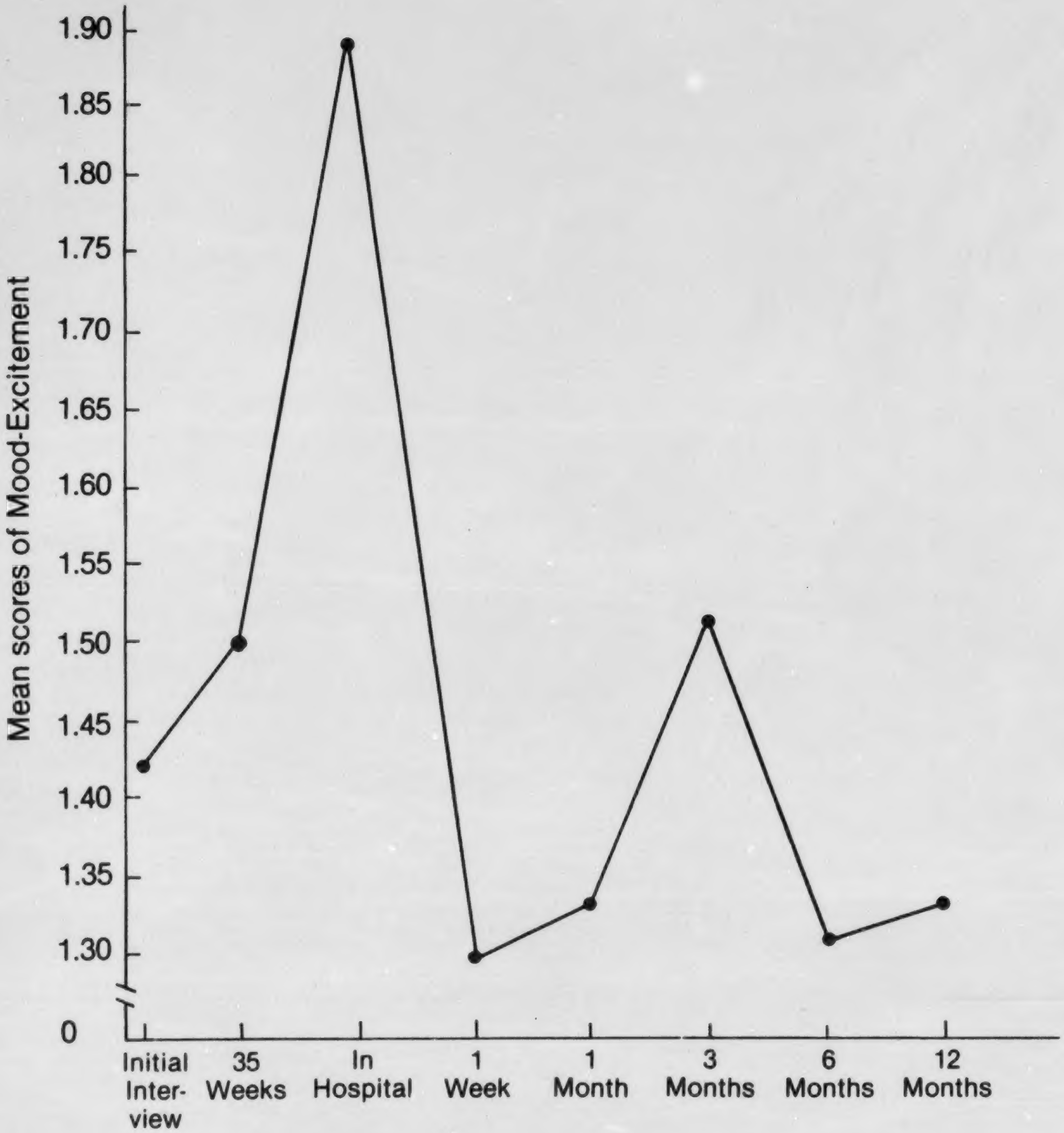

Figure 4: Level of Psychological Functioning During Pregnancy and One Year Postpartum - Mood-Excitement (N = 135)

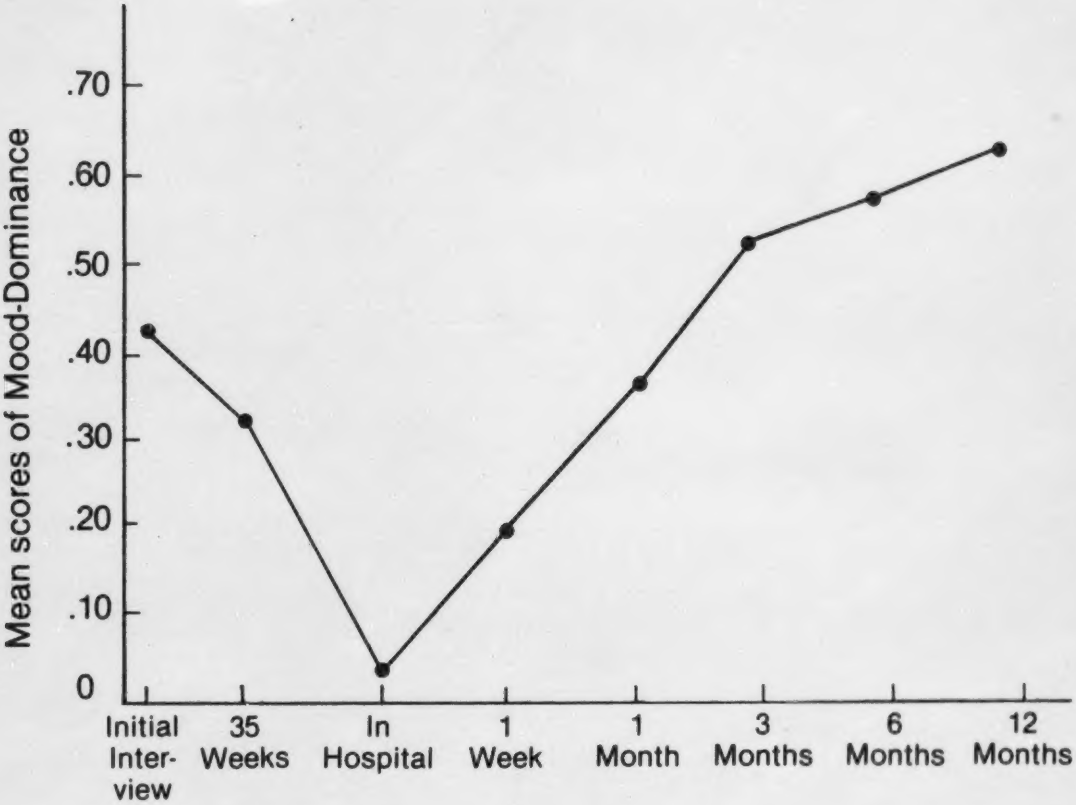

Figure 5: Level of Psychological Functioning During Pregnancy and One Year Postpartum - Mood-Dominance (N=135)

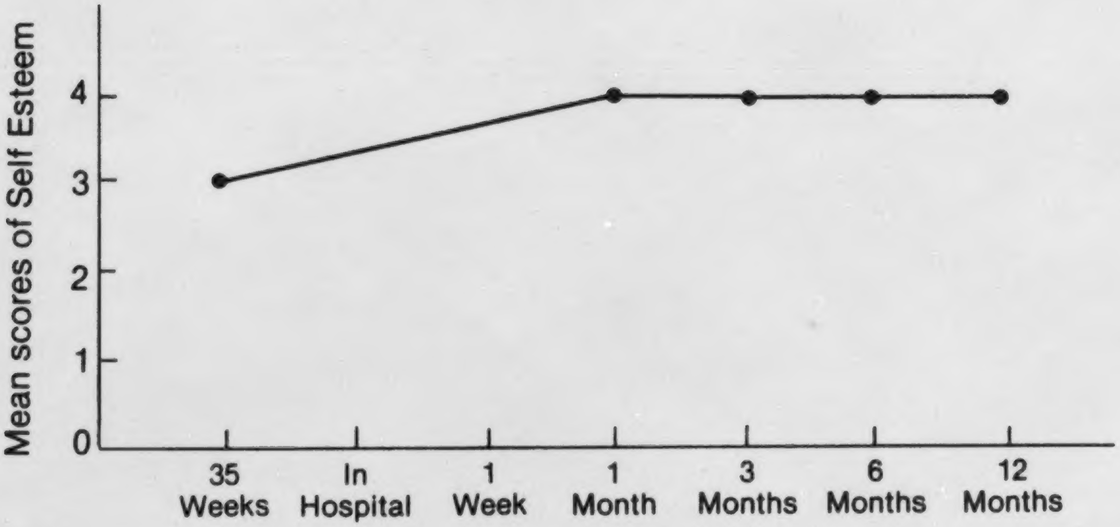

Figure 6: Level of Psychological Functioning During Pregnancy and One Year Postpartum - Self Esteem (N= 179)

Figure 2 shows the relationship between time of measurement and level of depressive affect.

Mood - arousal. There was a significant difference in the overall analysis, F (7,938) = 2.40. $p < .02$. The multiple comparisons showed that women were significantly less aroused in the prenatal period than in the postpartum. Although the women were significantly more aroused in hospital when compared to the 35 week time point or the one week at home, level of arousal in hospital was not significantly different from the combination of means of all other time points. Figure 3 reflects the relationship between the significant mood variables and time of measurement.

Mood - excitement. With respect to the excitement subscale of the measure of mood, there was a significant difference over time, F (7,938) = 4.00, $p < .001$. The multiple comparisons of the prenatal means with the postnatal means indicated that the combined mean scores for levels of excitement at these time periods did not differ. However, women felt more excited in the hospital than at any other time period, and more excited in hospital than in the prenatal period or at one week at home. See Figure 4.

Mood - dominance. Feelings relating to dominance were significantly different over the course of the study, F (7,938) = 7.91, $p < .01$. Multiple comparisons indicated that there was no significant difference in means when the level of dominance prenatally was compared to the combined means of all postpartum time periods. Lack of dominance was significantly lower in hospital compared to 35 weeks or one week at home; and significantly lower in hospital than at all other time points. See Figure 5.

Mood - stress and pleasure. Levels of stress and pleasure were not significantly different across the time periods measured in this study.

General self-esteem. General self-esteem was measured at five time points, and there was a statistically significant difference over time, $F\ (4,712) = 3.69$, $p < .01$. Subsequent analyses indicated that the women achieved higher means scores on self-esteem after the baby was born compared to prior to the birth. See Figure 6.

Postpartum Problems Experienced by the Mother

At each home visit the Nurse Interviewer obtained information from the women regarding problems that they had during the time prior to the visit. At the one and three month period, over 60% of the women reported that they had no problems; at six and twelve months, 70% and 69% respectively reported no problems.

At one, three and six months postpartum, medical problems were reported as being the most prevalent; 22%, 18% and 14% of the sample reported medical problems at these times. Emotional problems accounted for 9%, 7% and 6% respectively. One year after the birth, women rated financial problems as the most pressing, followed by medical and emotional difficulties. These data are outlined in Appendix S.

At six months postpartum the Nurse Interviewers were asked to evaluate the potential risk of their mothers for more serious problems: 84% percent of the sample of women were deemed to be at no risk, 10.6% questionable risk, 4.7% were felt to be "at risk." The Nurse Interviewers reported that emotional and family/marital stress were most characteristic of their risk group; they intervened in 13% of the sample. These data are outlined in Appendix T.

At the twelve month visit, the women were asked how stressful the past year had been for them; 15.8% stated that the year had been very stressful, 32.4% somewhat stressful and 51.9% stated that the year had not been stressful. Lack of sleep was considered to be the most stressful (24.6%), followed by adjustment (19.2%), and finally, "no time for self" (13.7%). Lack of privacy, interruption of social activities or the crying of the baby were not seen to be a problem by the majority of the women.

Psychological Functioning of the Fathers

Literature review

A brief review of the literature showed: that fathers are as nurturing as mothers; that father-infant relationships are as strong as mother-infant relationships; and that parents do not differ in their behaviour towards their infant (Clarke-Stewart, 1978; Field, 1978; Greenberg & Morris, 1974; Lamb, 1977, 1979, 1982; Parke & Sawin, 1976; Rendina & Dickerscheid, 1976).

Much of the work has been descriptive (Antle, 1975; Fein, 1976a, 1976b; Hangsleben, 1980; Leonard, 1976, 1977; Leonard, 1977; Reiber, 1976; Richards, Dunn, & Antonio, 1977; Taubenheim, 1981). Other research has evaluated the effect of childbirth preparation on the adjustment to fatherhood (Wente &

Crockenberg, 1976) or paternal attachment as it relates to presence at the birth (Bowen & Miller, 1980).

McNall (1976) investigated the concerns of fathers regarding the pregnancy and childbirth. He found that the major concern of expectant fathers related to labour and birth. Fathers were only moderately concerned about the changes in the relationship with their wife. Wandersman (1980) however, demonstrated that the quality of the marital relationship was central in the fathers adjustment to parenthood.

Gerzi and Berman (1981) pointed out that most of the knowledge of the father's experience of childbirth is based upon case studies, usually pathological, involving anxiety, depression, and psychosomatic reactions. Gerzi and Berman studied 52 Israeli men whose wives were in the last trimester of pregnancy comparing them with a matched control group of married men whose wives were not pregnant. It was found that expectant fathers were significantly higher than controls on this measure of anxiety. These authors suggested that studies assessing the reactions of fathers to pregnancy and birth are in order.

The men in this study completed many of the same psychological measures as the women. With the exception of the hospital time period, their data were examined in the same manner as for the women.

Inspection of Appendices F to H reveals that the mean scores on anxiety and depression obtained by the men in the study are within the normal range. Scores at or above the 75th percentile were classed as high anxiety or depression and those at the 25th percentile or less were classed as low anxiety or depression. See Appendix U for the cut-off scores.

Demographic variables. To ascertain whether the high/low anxiety and depression groups were comparable with respect to their demographic characteristics, Hotellings T^2 was conducted on this set of variables.

There was no relationship between anxiety or depressive affect and age, education, occupation or number of years married. The means and standard deviations for these data are in Table 24.

Hotellings T^2, followed by multiple comparisons, was conducted on the measure of mood (pleasure, arousal, dominance, excitement, stress) at each time period. Significant differences were seen between the high and low anxiety and depression groups on pleasure, dominance, excitement and stress at each time period. At the Initial Interview, one week postpartum, one and six months, fathers high on depression were also significantly lower on level of arousal. See Tables 25 to 31 for the means, standard deviations, F and p values.

T-test conducted on the attitude questionnaires revealed that, with the exception of the labor and birth questionnaire, both high and low groups on anxiety and depression had significantly less confidence in caregiving and attitude towards lifestyle changes since the birth of the baby. See Table 32 for the means, standard deviations, F and p values. Similarly, t-tests demonstrated that the highly anxious and depressed groups had significantly lower scores on marital adjustment measured in the prenatal period, and at three and twelve months postpartum. See Table 33 for the means, standard deviations, F and p values.

TABLE 24

Means and Standard Deviations of Variables in the Demographic Domain Obtained in Second Trimester of Pregnancy (20 Weeks) by Father

	Low Anxiety			High Anxiety			p	Low Depression			High Depression		
Variable	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD
Age	70	31.16	5.08	73	30.01	4.57	NS	64	30.92	5.54	90	29.89	4.50
Education	70	3.56	1.19	73	3.77	1.15	NS	64	3.41	1.12	90	3.77	1.10
Occupation	68	2.79	1.49	66	2.55	1.49	NS	61	2.92	1.51	77	2.56	1.43
Number of Years Married	70	4.53	2.53	73	3.89	2.60	NS	64	4.20	2.60	90	4.36	2.79

TABLE 25

Means and Standard Deviations of Psychological Measures Completed in Second Trimester of Pregnancy (20 Weeks) by Father

	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
Measures	N	$\overline{X}$	SD	N	$\overline{X}$	SD		N	$\overline{X}$	SD	N	$\overline{X}$	SD	
Trait Anxiety	71	37.35	9.73	72	52.38	7.50	.000	64	40.20	10.08	91	49.84	8.92	.000
Mood	57			63				50			80			
Pleasure		2.67	0.97		1.21	1.17	.000		2.70	0.85		1.33	1.21	.000
Arousal		−0.01	0.98		−0.24	0.94	NS		0.27	0.72		−0.48	0.94	.000
Dominance		1.50	1.09		0.67	1.08	.000		1.59	1.03		0.55	0.98	.000
Excitement		1.97	1.07		0.66	1.20	.000		2.24	0.89		0.56	1.00	.000
Stress		−2.69	1.01		−0.88	1.38	.000		−1.16	1.47		−2.45	0.95	.000

* Hotellings T^2 $\underline{F}(5,114) = 14.205$
$p \angle .0000$

Low N = 57	High N = 63
Pleasure	$p \angle .01$
Dominance	$p \angle .01$
Excitement	$p \angle .01$
Stress	$p \angle .01$

Hotellings T^2 $\underline{F}(5,124) = 20.589$
$p \angle .0000$

Low N = 50	High N = 80
Pleasure	$p \angle .01$
Arousal	$p \angle .01$
Dominance	$p \angle .01$
Excitement	$p \angle .01$
Stress	$p \angle .01$

TABLE 26

Means and Standard Deviations of Psychological Measures Completed in Third Trimester of Pregnancy (35 Weeks) by Father

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\overline{X}$	SD	N	$\overline{X}$	SD		N	$\overline{X}$	SD	N	$\overline{X}$	SD	
Mood	60			66				56			65			
Pleasure		2.92	0.83		0.95	1.36	.000		2.81	0.75		0.81	1.33	.000
Arousal		−0.24	0.94		0.07	1.02	NS		0.05	0.75		−0.33	1.05	.028
Dominance		1.41	1.10		0.47	1.04	.000		1.33	1.10		0.43	1.12	.000
Excitement		2.38	0.95		0.55	1.37	.000		2.35	0.80		0.31	1.35	.000
Stress		−2.87	0.82		−0.25	1.31	.000		−2.52	1.00		−0.44	1.42	.009

Hotellings T^2 $\underline{F}(5,120) = 38.237$		Hotellings T^2 $\underline{F}(5,115) = 25.969$	
$p \angle .0000$		$p \angle .0000$	
Low N = 60	High N = 66	Low N = 56	High N = 65
Pleasure	$p \angle .01$	Pleasure	$p \angle .01$
Dominance	$p \angle .01$	Dominance	$p \angle .01$
Excitement	$p \angle .01$	Excitement	$p \angle .01$
Stress	$p \angle .01$	Stress	$p \angle .01$

TABLE 27

Means and Standard Deviations of Psychological Measures Completed at 1 Week Postpartum by Father

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\overline{X}$	SD	N	$\overline{X}$	SD		N	$\overline{X}$	SD	N	$\overline{X}$	SD	
Mood	48			55				47			62			
Pleasure		3.22	0.76		1.20	1.38	.000		2.97	0.91		1.22	1.34	.000
Arousal		0.32	0.85		0.18	1.15	NS		0.45	0.81		-0.31	1.02	.000
Dominance		1.67	1.18		0.69	1.05	.000		1.56	1.11		0.63	1.05	.000
Excitement		2.76	1.12		0.79	1.37	.000		2.61	1.13		0.56	1.20	.000
Stress		-2.89	0.83		-0.42	1.40	.000		-2.51	1.05		-0.71	1.44	.000

Hotellings T^2 $F(5,97) = 25.53$

p∠.0000

Low N = 48	High N = 55
Pleasure	p∠.01
Dominance	p∠.01
Excitement	p∠.01
Stress	p∠.01

Hotellings T^2 $F(5,102) = 22.754$

p∠.0000

Low N = 47	High N = 62
Pleasure	p∠.05
Arousal	p∠.05
Dominance	p∠.05
Excitement	p∠.05
Stress	p∠.05

TABLE 28

Means and Standard Deviations of Psychological Measures Completed at 1 Month Postpartum by Father

	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
Measures	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Mood	53			57				51			71			
Pleasure		3.18	0.72		0.87	1.25	.000		3.03	0.93		1.22	1.32	.000
Arousal		-0.03	0.92		-0.20	0.97	NS		0.22	0.73		-0.46	1.00	.000
Dominance		1.68	1.30		0.39	0.98	.000		1.71	1.20		0.59	1.03	.000
Excitement		2.85	0.77		0.43	1.21	.000		2.71	0.96		0.70	1.27	.000
Stress		-3.06	0.74		-0.17	1.40	.000		-2.62	1.19		-0.80	1.49	.000

Hotellings T^2 $\underline{F}(5,104) = 39.32$

$p < .0000$

Pleasure	$p < .05$
Dominance	$p < .05$
Excitement	$p < .05$
Stress	$p < .05$

Hotellings T^2 $\underline{F}(5,116) = 21.59$

$p < .0000$

Pleasure	$p < .05$
Arousal	$p < .05$
Dominance	$p < .05$
Excitement	$p < .05$
Stress	$p < .05$

TABLE 29

Means and Standard Deviations of Psychological Measures Completed at 3 Months Postpartum by Father

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\overline{X}$	SD	N	$\overline{X}$	SD		N	$\overline{X}$	SD	N	$\overline{X}$	SD	
Mood	57			60				55			65			
Pleasure		2.74	0.85		0.76	1.20	.000		2.53	0.93		0.86	1.23	.000
Arousal		-0.01	0.74		-0.03	0.90	NS		0.31	0.91		-0.06	0.95	.03
Dominance		1.60	1.04		0.39	0.92	.000		1.48	1.24		0.48	0.93	.000
Excitement		2.21	0.90		0.48	1.27	.000		2.22	0.95		0.53	1.29	.000
Stress		-2.54	0.92		-0.17	1.23	.000		-2.09	1.15		-0.39	1.33	.000

Hotellings T^2 $\underline{F}(5,111) = 28.72$
p∠.0000
Pleasure p∠.01
Dominance p∠.01
Excitement p∠.01
Stress p∠.01

Hotellings T^2 $\underline{F}(5,114) = 15.209$
p∠.0000
Pleasure p∠.01
Dominance p∠.01
Excitement p∠.01
Stress p∠.01

TABLE 30

Means and Standard Deviations of Psychological Measures Completed at 6 Months Postpartum by Father

Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Mood	52			49				61			58			
Pleasure		2.83	0.74		0.50	1.22	.000		2.56	0.88		0.66	1.33	.000
Arousal		−0.24	1.08		−0.03	1.15	NS		0.42	0.94		−0.57	0.87	.000
Dominance		1.47	1.03		0.36	1.03	.000		1.45	1.08		0.42	1.01	.000
Excitement		2.24	0.97		0.10	1.47	.000		2.13	1.12		0.08	1.35	.000
Stress		−2.65	0.85		0.29	1.23	.000		−2.06	1.09		−0.37	1.63	.000

Hotellings T^2 $F(5,95) = 40.818$
p∠.0000

Pleasure	p∠.01
Dominance	p∠.01
Excitement	p∠.01
Stress	p∠.01

Hotellings T^2 $F(5,113) = 25.405$
p∠.0000

Pleasure	p∠.01
Arousal	p∠.01
Dominance	p∠.01
Excitement	p∠.01
Stress	p∠.01

TABLE 31

Means and Standard Deviations of Psychological Measures Completed at 12 Months Postpartum by Father

	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
Measures	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Mood	42			49				40			53			
Pleasure		2.94	0.59		0.54	1.10	.000		2.65	0.92		0.83	1.23	.000
Arousal		0.07	0.84		-0.02	1.04	NS		0.18	0.94		-0.21	1.24	NS
Dominance		1.69	1.11		0.41	0.81	.000		1.75	0.99		0.58	0.92	.000
Excitement		2.44	0.85		0.25	1.12	.000		2.34	1.03		0.43	1.23	.000
Stress		-2.60	0.87		0.05	1.13	.000		-2.32	1.10		-0.41	1.43	.000

Hotellings T^2 $\underline{F}(5,85) = 39.949$
p∠.0000

Pleasure	p∠.05
Dominance	p∠.05
Excitement	p∠.05
Stress	p∠.05

Hotellings T^2 $\underline{F}(5,87) = 15.892$
p∠.0000

Pleasure	p∠.05
Dominance	p∠.05
Excitement	p∠.05
Stress	p∠.05

TABLE 32

Means and Standard Deviations of Paternal Attitude Measures Completed at Each Time Point

Time Points & Measures	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Prenatal														
Worries re Pregnancy	69	36.79	5.58	72	32.26	6.69	.000	61	37.05	5.52	90	32.70	6.20	.000
Worries re Birth	69	18.20	4.25	72	16.26	4.14	.007	61	17.38	4.63	90	16.64	3.72	NS
1 Week														
Care	49	40.49	5.62	55	35.22	7.53	.000	47	39.70	6.88	63	36.44	6.84	.015
Change	49	29.67	4.40	55	24.42	4.97	.000	47	29.60	4.69	63	25.30	5.02	.000
1 Month														
Care	52	35.02	5.95	54	29.48	5.84	.000	50	34.32	6.17	68	29.99	5.80	.000
Change	52	25.08	3.23	54	19.78	4.82	.000	50	24.60	3.55	68	21.22	4.62	.000
3 Months														
Change	57	40.63	6.65	57	33.95	7.21	.000	54	40.32	7.44	64	35.13	6.46	.000
6 Months														
Change	46	38.57	6.87	49	33.57	6.54	.000	54	37.91	6.56	58	34.66	6.77	.011
12 Months														
Change	41	41.49	6.17	48	33.94	6.08	.000	42	39.71	7.18	54	34.15	5.99	.000

TABLE 33

Means and Standard Deviations of Marital Adjustment
Completed at Three Time Points by Father

	Low Anxiety			High Anxiety			p	Low Depression			High Depression			p
	N	$\bar{X}$	SD	N	$\bar{X}$	SD		N	$\bar{X}$	SD	N	$\bar{X}$	SD	
Prenatal														
35 Weeks	45	121.58	14.49	50	111.44	10.35	.000	43	119.84	10.52	51	113.16	12.20	.006
Postpartum														
3 Months	57	119.61	12.10	55	110.58	10.55	.000	55	120.33	11.33	65	111.58	11.77	.000
12 Months	43	120.42	11.46	46	107.65	12.64	.000	41	119.22	10.24	50	109.42	13.74	.000

Assessment of Psychological Functioning Over time

An analysis of variance for repeated measures was conducted on the psychological measures completed by the fathers at the various time points. These measures included anxiety, depressive affect and mood (arousal, pleasure, dominance, stress and excitement). The means and standard deviations of these measures are in Table 23. If a significant F occurred, the analyses were followed by multiple comparison using the Scheffe procedure with alpha set at .05. This analysis was followed by one planned comparison; the level of psychological functioning in the prenatal period was compared with the level of functioning in the postpartum period.

There was a significant difference in the level of depressive affect of the fathers, F (6,756) = 8.31, p < .00. The prenatal/postpartum comparison however was not significant. Similarly, although there was a significant difference over time relating to the level of father's excitement, F (6,570) = 3.73, p < .002, the prenatal/postpartum comparison comparing the level of excitement before and after the birth was not significant.

There was no significant difference in the fathers' level of psychological functioning across time with respect to anxiety and mood (arousal, dominance, pleasure and stress).

A Comparison of the Psychological Functioning of Couples

The psychological functioning of the couples in this study was compared using paired t-tests. The means and standard deviations are in Table 34. As can be seen from this Table, throughout the study the men obtained

TABLE 34

Comparison of Psychological Functioning of Mother/Father Pairs: Means and Standard Deviations of Measures

Measures	N of pairs	Mothers		Fathers		p
		$\bar{X}$	SD	$\bar{X}$	SD	
Initial Interview						
Anxiety	239	43.85	10.00	46.29	10.98	.003
Depression	243	46.96	7.95	46.34	7.07	NS
Mood						
Pleasure	198	2.24	1.26	1.99	1.15	.021
Arousal	198	-.41	1.01	-.03	.93	.001
Dominance	198	.37	.95	1.08	1.07	.001
Excitement	198	1.49	1.28	1.39	1.15	NS
Stress	198	-1.95	1.42	-1.73	1.32	NS
Attitudes						
Worries re labor and birth	224	17.32	4.25	17.49	4.66	NS
Attitude to pregnancy	224	33.67	6.51	34.71	5.77	.05
35 Weeks						
Anxiety	228	45.90	10.84	45.32	11.30	NS
Depression	226	47.02	7.32	45.24	8.23	.006
Mood						
Pleasure	227	2.12	1.25	1.96	1.26	NS
Arousal	227	-.46	1.02	-.04	.94	.001
Dominance	227	.31	.89	.97	1.09	.001
Excitement	227	1.47	1.31	1.43	1.30	NS
Stress	227	-1.80	1.32	-1.59	1.43	NS
Marital adjustment	164	118.88	12.29	116.00	12.20	.003

continued ...

TABLE 34

Comparison of Psychological Functioning of Mother/Father Pairs: Means and Standard Deviations of Measures

Measures	N of pairs	Mothers		Fathers		p
		$\bar{X}$	SD	$\bar{X}$	SD	
One Week Postpartum						
Anxiety	192	47.92	11.51	45.57	11.40	NS
Depression	193	50.23	7.29	45.38	7.08	.001
Mood						
Pleasure	189	2.11	1.38	2.14	1.26	NS
Arousal	189	-.44	.94	.14	.93	.001
Dominance	189	.17	1.03	1.09	1.09	.001
Excitement	189	1.33	1.44	1.68	1.33	.009
Stress	189	-1.54	1.57	-1.58	1.37	NS
Attitudes						
Confidence in caregiving	191	35.66	6.64	38.07	6.79	.001
Change in lifestyle	191	26.32	5.14	27.31	4.85	.01
One Month						
Anxiety	214	43.92	11.57	44.55	11.81	NS
Depression	216	47.41	7.08	45.16	7.91	.001
Mood						
Pleasure	210	2.29	1.23	2.13	1.26	NS
Arousal	210	-.41	.84	-.12	.91	.001
Dominance	210	.41	1.03	1.09	1.16	.001
Excitement	210	1.49	1.30	1.69	1.31	NS
Stress	210	-1.79	1.56	-1.70	1.47	NS
Confidence in caregiving	194	30.23	6.04	31.93	6.00	.001
Attitude to lifestyle change	194	20.16	4.01	22.58	4.47	.001

continued ...

TABLE 34

Comparison of Psychological Functioning of Mother/Father Pairs: Means and Standard Deviations of Measures

Measures	N of pairs	Mothers $\overline{X}$	Mothers SD	Fathers $\overline{X}$	Fathers SD	p
Three Months						
Anxiety	202	43.19	11.63	45.69	11.67	.006
Depression	202	46.67	6.43	45.21	7.22	.015
Mood						
Pleasure	201	2.22	1.20	1.86	1.17	.001
Arousal	201	−.28	.94	.05	.88	.001
Dominance	201	.61	1.04	.99	1.06	.000
Excitement	201	1.60	1.28	1.47	1.18	NS
Stress	201	−1.85	1.41	−1.47	1.32	.001
Marital adjustment	200	118.66	12.69	115.82	12.20	.001
Attitude to lifestyle change	202	32.73	6.59	37.72	7.36	.001
Six Months						
Anxiety	188	44.29	11.04	46.38	11.52	.028
Depression	191	48.81	7.19	47.37	7.35	.020
Mood						
Pleasure	190	2.04	1.29	1.76	1.28	.020
Arousal	190	−.35	.89	−.09	.96	.005
Dominance	190	.63	.97	.97	1.06	.001
Excitement	190	1.40	1.29	1.23	1.38	NS
Stress	190	−1.75	1.40	−1.38	1.46	.007
Attitude to lifestyle change	177	33.05	6.10	36.05	6.54	.001

continued ...

TABLE 34

Comparison of Psychological Functioning of Mother/Father Pairs: Means and Standard Deviations of Measures

Measures	N of pairs	Mothers		Fathers		p
		$\overline{X}$	SD	$\overline{X}$	SD	
		Twelve Months				
Anxiety	174	44.56	11.74	46.55	11.11	.037
Depression	175	48.71	7.58	49.00	7.5	NS
Mood						
Pleasure	171	2.07	1.37	1.84	1.21	.045
Arousal	171	-.27	1.03	-.02	1.02	.021
Dominance	171	.63	1.07	1.10	1.02	.001
Excitement	171	1.42	1.31	1.37	1.26	NS
Stress	171	-1.74	1.50	-1.46	1.37	.042
Marital adjustment	166	115.49	13.17	114.32	12.23	NS
Attitude to lifestyle change	170	33.61	6.44	37.03	6.61	.001

significantly higher scores on arousal and dominance than the women. They were more anxious during the prenatal period than their partners but had a significantly more positive attitude towards the pregnancy.

In the postpartum period the men were significantly more anxious and stressed than their partners at 3, 6, and 12 months. Conversely, they had not only significantly more confidence in caregiving but also felt significantly more positive about the lifestyle change brought about by the baby than did the women.

The women were significantly more depressed than their partners most of the time; they had significantly less positive attitudes towards their lifestyle change since the arrival of their baby. On the other hand the women had a significantly higher level of marital adjustment than their partners, and felt more pleasure than their partners throughout most of the childbearing period.

Discussion

Contrary to expectations engendered by the scientific and popular literature, pregnancy and childbirth was not shown to be a time of poor psychological health, anxiety and depression. These findings support the results of recent studies and are strengthened by Nurse Interviewer reports showing that less than 1% of the sample used tranquillizers at any time during the study and less than 2% of women used mood elevators at 3 and 12 months.

Anxiety and Depression

Although the women/men in this sample were not depressed or anxious in the clinical sense, the most consistent finding was the significant association between anxiety and depression with other areas of functioning. During pregnancy and the year following the birth, the women and men in the more anxious and depressed groups reported feeling less pleasure, less excitment, more stress and less positive social and marital adjustment, less positive attitude to change in lifestyle, and less confidence in caregiving.

The anxious women reported more regative life events and lowered self-esteem while level of arousal was often lowered for the depressed women. In addition, the greater the psychological distress, the lower the ratings of maternal physical and mental health; the more anxious and depressed, the less appropriate the weight gain.

After the birth of their baby anxious and depressed groups expressed less satisfaction with their experience in hospital and with the birth, and more often rated their labor as difficult. This is compatible with findings that psychologically distressed individuals report more dissatisfaction across a wide range of health services (Greenley, Young, & Schoenherr, 1982).

Attitude towards Baby

The anxious and depressed groups reported that they took longer to feel close to the baby, had less confidence in caregiving for the baby after being home for one week and at one month. They also felt less positive about the lifestyle changes brought about by the baby throughout the postpartum.

Paradoxical Findings

There is a certain paradox in the above findings. On one hand, this sample of women and men were not clinically depressed. On the other hand, increasing levels of depressive affect related to increasing psychological dysfunction. When this sample was categorized into high and low depression, one obtains exactly what might be predicted using a cognitive behavioral model of depression. The finding that a significantly greater proportion of the anxious and depressed women rated their birth as more difficult, even though there were no differences between these groups in terms of birth outcomes obtained from medical records is additional support for the cognitive theory of depression. The cognitive theory of depression (Beck, 1974) postulates that depression is seen as a result of a triad of cognitive disturbances which predisposes an individual to various forms of thought and behavioural characteristics of depression. The components of this triad are "a negative view of the future, of the environment and of himself." It could be argued that the individuals in this study who experienced depressive affect tended to see their experiences in a less positive light. Consistent with this, the women in the study were (a) more depressed than their partners throughout the duration of the study and (b) had significantly less positive attitudes towards their lifestyle change after the birth of the baby.

Consistent with findings in this study, Cutrona (Note 10) reported relatively few cases of clinically depressed women in her sample. She found the same social and environmental factors associated with subclinical depression as have been postulated for clinical depression. Are these differences due to a cognitive style characteristic of depressed people that endures in the absence of a depressed mood? - this has been suggested by Lungni (1977).

Miller (1975) reviewed the literature and demonstrated that such deficits occuring in depression depend largely on the severity of depression rather than the type of depression. He maintained that depressed individuals in the normal population are generally characterized by deficits similar in nature but smaller in degrees to those of depressed clinical patients. If depression is viewed quantitatively rather than qualitatively, then one would predict that the higher the level of depressive affect the higher the level of dysfunction in other areas. When the sample of women and men were divided into high and low categories of depressive affect this is precisely what was seen.

Personality Characteristics

The personality characteristics of the women certainly reflect depressive overtones. Women scoring highly on depression do not have a lighthearted approach to life. Women in the highly depressed groups endorsed statements indicating that they: want to be free; do not enjoy being with people, do not enjoy being the centre of attention or engaging in behaviours which attract them to others. These women do not like to spend much time participating in social activities neither do they like ambiguous situations.

Depressive Affect Peaks in Hospital

The peaking of depression in hospital is consistent with clinical lore and has also been reported in two previous studies using a similar population (Bradley, 1977; Bradley et al., 1978), and with other research cited by Cutrona (Note 10).

The level of psychological functioning of the women during their participation in the study was quite stable, with the exception of the immediate postpartum period. This stability is shown by the small percentage of women who changed categories of depression (high/low) at each time point. The maximum change (10.9%) occurred between hospital and one week at home.

It is evident from inspection of Figures 1 to 5, that the period immediately after the birth was when the women were most emotionally labile. Affect at that time was a mixture of excitment, arousal, anxiety, depressive mood and a lack of dominance.

Hospitalization

That the women felt less dominant while in hospital may relate to their being treated as a "patient". The point has been made that the psychological impact of hospitalization includes several areas of distress among which is fear, increased irritability and unhappiness (Rachman & Phillips, 1980). Should women entering hospital to have their baby feel any differently? According to Jordan (1980), "decision-making power and responsibility for her state pass from her to hospital personnel and the physician in charge" (p. 33). The lack of dominance is consistent with findings of other researchers whose sample of women were more submissive in hospital than the norms against which they were being measured (Pascall & Newton, 1976).

Shaw (1974) has argued that hospital procedures serve to depersonalize the laboring woman, and that the loss of sense of self that occurs is analogous to what happens in other institutions (p. 65). According to Leifer (1980) the hospital staff and physical setting "played a significant and often cricial role in shaping and coloring women's responses to childbirth" for the women in her study (p. 143). Rich (1976) stated "the loneliness, the sense of abandonment, of being imprisoned, powerless, and depersonalized is the chief collective memory of women who have given birth in American hospitals" (p. 172).

After the women returned home, their level of affect soon approximated their prenatal levels. This may have led researchers such as Pitt (1973) to call the blues a "trivial fleeting phenomenon." Although the blues may be "trivial" (in the sense that they last for such a short time) childbearing and childbirth should not be "trivialised."

Re-evaluation of Depression in the Postpartum Period

Women are at the greatest risk for depression. A number of studies have demonstrated that two to six times as many women as men are diagnosed as suffering from depression, many of them in the postpartum period (Penfold, 1981). However, there is such inconsistency among the medical and psychological professions about what constitutes depression, that the question arises as to whether there exists necessary or sufficient conditions for a diagnosis of postpartum depression (except perhaps in the rare instances of a postpartum psychosis). Moreover, one might question the appropriateness of using such terms as postpartum depression, postpartum adjustment, postpartum emotional disorders, when it has been stated repeatedly in the literature that depressive disorders occurring in association with the childbirth cannot be distinguished from those occuring at other times. Furthermore, a review of studies which have published the means and standard deviations of their measures of anxiety and depression revealed that, in fact, women are not "clinically" depressed (Bradley, 1977; Bradley et al., 1978; Lubin, 1967; O'Hara et al., 1982; Rees & Lutkin, 1971). Other researchers (Barclay et al., 1976; Pascall and Newton 1976) have found that after the birth, their sample of women were not significantly different from non-puerperal women.

Yet another reason for re-evaluating the label of postpartum depression, per se, is that the disturbances in critical areas in the life of an individual seen as symptoms for depression, are also "normal" disturbances of the postpartum period. These include the neurovegatative conditions, for example, disturbances in sleeping, eating, sexual activity, and work (Rehm, 1981).

It is stated in DSM III (1981) under "Affective Disorders" that for a diagnosis of depression, four out of the eight listed symptoms must be present nearly evey day for a period of at least two weeks. At least four of the listed symptoms of depression can also be seen in the postpartum period. For example, problems with appetite, sleep disturbances, loss of energy, fatigue, loss of interest in usual activities, and decreased sexual drive. However, these "symptoms" are associated with the birth rather than the results of depression.

Many of the somatic symptoms attributed to depression can be related to the physical state of newly birthed women who endure discomfort on several levels: physical (episiotomy, sore nipples, hemorrhoids, contractions, pain); physiological and hormonal changes in the body; sleeplessness, irritability, fatigue.

Lack of sleep during late pregnancy and postpartum may be a major contributor to irritability, fatigue and depression. A reduction in total sleep, in Stage IV sleep, and increased awakening has been found to occur in late pregnancy with regular sleep patterns not returning until 4 to 6 weeks postpartum (Karacan & Williams, 1970; Karacan, Heine , Agnew, Williams, Webb, & Ross, 1968). Moreover, there is institutional discomfort, e.g. a strange environment, strange bed, hospital routine, regulations, sensory deprivation from her normal environment - all of which make rest more difficult. Enough to make anyone cry - but crying is not synonymous with depression (Yalom et al. 1968).

The thesis is that the health professionals are doing childbearing women a disservice by labelling what may be the "normal" experience as pathological. If problems warranting professional intervention do exist, they may not necessarily be related to the new baby, but more to difficulties in the psychosocial area (marital relationship, extended family, external stress, financial limitations, loneliness); ill health; prior depressive episodes; or a difficult baby. Paykel et al. (1980) suggested that pregnancy and childbirth are additional stressors rather than causes of depression. The point is pregnancy and birth are normal natural events. It is the stress related events surrounding them that pathologize the experience. The relationship between depression in the postpartum and the stress related events warrant further investigation.

The fact that the majority of women in the study were not clinically depressed does not obviate the need for a systematic approach to the psychological needs of families during the childbearing year. Researchers have stated that depression in the postpartum period is related to depression in the prenatal period; the data from this study indicated that the level of psychological functioning of the paticipants remained stable throughout the duration of the study. This suggests the possibility of a preventative approach early in pregnancy.

Anxiety and Obstetrical Complications

There was no association among measures of prenatal anxiety, obstetric outcome or infant health at birth. These findings are consistent with recent research using similar measures (Beck et al., 1980; Cox et al., 1982; Edwards, 1970; Farber et al., 1981; Gorsuch & Key, 1974) but contradict earlier work of others (Blumberg, 1980;Crandon, 1979a, 1979b; Davids, de Vault & Talmadge, 1969; McDonald, Gynther, & Christakos, 1963).

One explanation of the conflicting findings may be that on average the women in this study were healthy; had good pregravid weight; gained an appropriate amount of weight during pregnancy; had quality prenatal care and attended prenatal classes. Not only were the women healthy, but so were their babies. In most of the studies reviewed, socioeconomic status, pregravid weight and parity were not taken into account although they are factors known to be related to pregnancy and obstetric outcome.

Although the women in this study were quite dissimilar to the high risk sample of Farber et al. (1981) similar results were obtained with respect to prenatal anxiety and obstetric complications. In Farber's study, 46% of the mothers had problems during pregnancy and approximately 30% of them had birth problems. Complications during birth occurred to 60% of the women in our study. In neither study did prenatal anxiety relate to complications or difficulty at birth.

Despite a high level of maternal complications at birth in the present study, there was no relationship between complications and postpartum psychological functioning, whereas, in Farber's sample there was a significant relationship between complications of pregnancy and birth, and anxiety at 3 months. Farber and associates pointed out that complications may well lead to increased anxiety levels rather than the opposite (p. 274). However, the data can be interpreted in another way since the infants in Farber's study had a high percentage of anomalies. Maternal anxiety at 3 months may be more associated with infant health than birth or pregnancy complications.

That complications were not related to state anxiety but were related to the Harmavoidance subscale of the personality scale supports Peterson (1981) who stated that inability to cope with pain and labour places a women at risk for developing complications during labour. Peterson also stated that women give birth in the manner and style of her approach to life (p.3).

The data suggest the need for a multifactorial approach to the study of psychology of pregnancy and birth, not a unifactorial one. It is important to look at the broad aspect of mental and physical health in terms of risk assessment and support in the promotion of optimal pregnancy outcomes. Only then may it be possible to clarify the relationship between specific psychological functions (e.g. anxiety) and perinatal outcomes.

Maternal Functioning and Infant Development

It is quite clear from this sample of mothers and babies that the level of maternal functioning was unrelated to the level of infant development. Higher levels of anxiety or depression do not reflect negatively on infant cognitive and motor development at 12 months, or upon maternal attachment as measured in the Strange Situation procedure.

Infant temperament. The categorization of infants on the Carey Infant Temperament Survey were similar to other samples of American infants (Carey, 1977; Vaughn, Taraldson, Crichton, & Egeland, 1980). Highly anxious women rated their babies as difficult. These results were also found in the study conducted by Vaughn and associates. Because there were no significant differences between babies of low and high anxious women in terms of cognitive and motor development or the secure/anxious association between anxiety and a difficult baby suggests that highly anxious mothers are not perceiving their baby as do others. This is certainly congruous with their perception of the birth experience. The anxious women perceived their birth experience as more difficult even though there were no significant differences between high and low groups and the obstetric variables taken from the medical records.

Strange Situation. This is one of the first major studies of Canadian infants utilizing the Strange Situation procedure. The proportions of infants within each category are similar to American studies (Ainsworth et al, 1978; Sameroff et al., 1982). The major finding was that the level of psychological functioning of the mother was unrelated to the categories of secure/anxious attachment. This finding is not unique. It supports the validity of the Strange Situation assessment as an index of the quality of the mother-infant interaction rather than reflecting the personality of the mother (Waters, Note 11).

Recently published American studies support these findings. Sameroff, Seifer, and Zax (1982) reported on their longitudinal investigation of three groups of women varying on three dimensions of mental health. They found no association between diagnosis (schizophrenia, neurotic depressive, personality disorder) and the Strange Situation category to which the one year old infant had been assigned. Support for the present results comes from studies in preparation (Connell, Note 12; Herman, Note 13) in which no association has been found between mothers at risk (for alcohol, drug abuse or severe psychological problems) and the secure/anxious dimensions of the Strange Situation assessment.

It can be argued that if no association between infant attachment and maternal dysfunction is found in high risk women, it is unlikely that an association would be found with a low risk sample such as the women in this study. The majority of women in this study had social support, attended prenatal classes, and were visited by Nurse Interviewers during the study.

The relationship between depression and disorders of mothering remains to be empirically determined, but earlier studies and more recent investigations suggest the need for longitudinal research concentrating on the high risk family.

CHAPTER V

PSYCHOSOCIAL FACTORS RELATING TO BREASTFEEDING

Literature Review

Benefits of Breastfeeding

The accumulated evidence of medical and social research on on infant feeding supports the argument that breast milk provides optimum nourishment for human infants (Jelliffe & Jelliffe, 1977; 1980; Rousseau, Lescop, Fontaine, Lambert, Roy, 1982). Breast milk is more protective against infection and is anti-allergenic (American Academy of Pediatrics, 1978; Barness, 1977; Taylor, 1977; Jelliffe, & Jelliffe, 1977; Ellis & Hewatt, Note 14).

Psychological Factors

Although the psychological benefits of breastfeeding have often been promoted (Academy of Pediatrics, 1979; Arafat, Allen & Fox, 1981; Klaus & Kennell, 1976, 1981; Riordain & Rapp, 1980; Waletzky, 1979; Ellis & Hewatt, Note 14) the literature investigating the psychological factors involved in breastfeeding is virtually non-existent. Moreover, the literature illustrates the conflicting opinions held. For example, Waletzky (1979) stated that, "For those who really do not want to try breastfeeding, it is important to encourage other means of bonding with their child" (p. 354). Berger (1978) on the other hand stated that, "There are, however, absolutely no data documenting that breast-fed infants become any more loved, or "attached" to their parents, than bottle fed babies" (p.18).

Golub (1978) cited studies which have suggested that breastfeeding mothers are: better adjusted, more passive, more interested in body contact and affection, and influenced by the attitudes of husband and experiences of others in the environment. Utilising a standardized measure, Golub found no significant differences between women who breast or bottlefed their infant. Switzky, Vietze and Switzky (1979) compared breastfeeding and bottlefeeding women. They described the breastfeeding women as college educated with a fairly well adjusted marriage who look for: support from friends with breastfeeding experience; verbal encouragement and support of husband.

Incidence

Although breastfeeding has increased in North America since the 1960's, the literature revealed that there is a low success rate for breastfeeding (Crowder, 1981; Neifert, 1980). In the last few years there has been a renewed interest in the study of factors that promote nursing, and an effort has been made by health professionals to increase the incidence and length of time that an infant is breastfed (BCMA, 1980; CPS, 1979; de Chateau & Winsberg, 1978; Ellis & Hewatt, Note 14). Recent studies conducted in British Columbia have shown that the incidence and duration of breastfeeding could be increased when consistent, knowlegeable teaching and support were provided throughout the childbearing cycle (Bradley, Ross & Warnyca, Note 3). However, researchers working in the field of infant feeding maintained that the variables which distinguish between successful and nonsuccessful breastfeeding have not yet been identified (Gulick, 1982; Helsing, 1976; Olds & Eiger, 1976).

Hospital Influences

Palmer and associates, (Palmer, Avery, & Tayler, 1979), cited a survey of infant feeding practices done in England which showed that forceps-assisted deliveries and cesarean sections were associated with a delay in starting breastfeeding. This in turn reduced the likelihood of the mother breastfeeding at two weeks postpartum. Martin (1978) found that induction and forceps/vacuum deliveries were associated with a delay in starting breastfeeding and with higher failure rates before 7 to 14 days postpartum. An Australian study of over 10,000 women investigated the relationship of perinatal factors to breastfeeding (Boulton & Flavel, 1978). While the proportion of women breastfeeding whose labour had been induced was similar to the overall figure for breastfeeding (46.5%), the proportion of women who had an elective or unplanned cesarean section was significantly lower than average. It was also found that social class was positively associated with breastfeeding, while ethnic origin was not.

Results

The present study provided the opportunity to investigate in a homogeneous sample, the psychological and psychosocial factors that influence the duration of the breastfeeding experience.

Ninety-five percent of the women in this study were breastfeeding their baby on discharge from hospital. At one month postpartum, 87% of the women were breastfeeding their baby; at three months 73%; at six months 45% and at twelve months 19% women were breastfeeding their baby. The women breastfed their babies for a mean of 6.75 months.

Length of Time Breastfeeding

The relationship between length of time the mother breastfed their infants and demographic, psychological, marital, social, and attitudinal variables was examined using the Pearson Product Moment correlation coefficient. These are shown in Table 35.

Perhaps the most encouraging observation was the number of women who chose to breastfeed and who maintained this behaviour for almost seven months. Women who chose to breastfeed in this study were well educated, had higher socioeconomic status and were supported by friends and family, thus replicating the recent findings of other researchers (Boulton & Flavel, 1978; Rousseau et al. 1982).

The information obtained from this sample of breastfeeding women indicated that while breastfeeding is unrelated to the age of the parents, parents who have a higher level or education and occupation are more likely to choose breastfeeding for a longer period of time.

Psychological Variables

Women who chose to breastfeed for a longer period described themselves as accomplishing, achieving, ambitious, resourceful. They described themselves as: sensitive to many forms of experience, sensous, enjoying physical sensations, inquiring, analytical, reflexive, curious. These women were not aggressive nor did they

TABLE 35

Pearson Product Moment Correlation Coefficients Between Selected Variables and Number of Months Breastfeeding

Prenatal

	N	r	p
Education level of mother	214	.1551	.012
Education level of father	207	.1179	.045
Occupational level of mother	196	-.2281	.001
Achievement	193	.1380	.028
Aggression	193	-.1187	.050
Harm Avoidance	193	-.1576	.014
Sentience	193	.1618	.012
Social Recognition	193	-.1739	.008
Understanding	193	.2660	.001
Depression	205	-.1251	.037
Trait Anxiety	213	-.1675	.007
Concern with labor and birth	204	.1201	.044
Attitude to pregnancy	174	.1987	.004
Stress	213	.1335	.026

Postpartum

	N	r	p
Depression			
in hospital	175	-.1164	.036
3 months	204	-.1660	.008
12 months	201	-.1414	.023
State Anxiety			
in hospital	177	-.1761	.010
1 week post-discharge	182	-.1651	.013
6 months	207	-.1357	.026

continued ...

TABLE 35

Postpartum

	N	r	p
Mood - Stress			
in hospital	173	-.1345	.039
1 week post-discharge	174	-.1635	.016
3 months	203	-.1558	.013
Mood - Pleasure			
1 month	204	.1296	.032
3 months	207	.1119	.054
6 months	208	.1373	.024
Self-Esteem			
1 month	205	.1355	.026
3 months	207	.1363	.025
6 months	201	.1748	.007
Number of days in hospital	201	-.1633	.010
Hospital Questionnaire (in hospital)			
satisfaction with hospital experience	191	.1223	.046
labor and birth	191	.2152	.001
confidence concerning mothering role	191	.1954	.003
preparation for mothering role	191	.1952	.003
Hospital Followup Questionnaire (1 month)			
satisfaction with hospital experience	237	.3027	.000
confidence concerning mothering role	237	.1770	.003
control over labor & birth	237	.1737	.004
satisfaction with mothering role	237	.2018	.001
Confidence in caregiving (1 month)	198	.2833	.001

continued ...

TABLE 35

Postpartum

	N	r	p
Attitude to change in lifestyle			
1 week post-discharge	185	.1456	.024
1 month	199	.1654	.010
Stress *			
1 month	210	.1352	.025
6 months	206	.1132	.053
Social Support **			
1 month	207	-.1582	.011
3 months	201	-.1470	.019
6 months	206	-.1904	.003
12 months	211	-.1239	.036
Father's confidence in caregiving			
1 month	165	.1528	.025

* higher score = less stress

** lower score = more support

describe themselves as fearful, apprehensive, or avoiders of risk. They were not concerned about their reputation, nor desired to be held in high esteem by others. It is of interest that personality characteristics such as affiliation and nurturance were unrelated to length of time a woman breastfed her baby.

The women who breastfed for a longer period were less anxious, less depressed and less stressed throughout the childbearing year. They reported higher levels of self-esteem and pleasure during the postpartum periods. Length of time breastfeeding was related to social support but not to negative life events, the social adjustment of the women or to the marital adjustment of both parents. Length of time the mother breastfed her baby was unrelated to the level of anxiety or depression of the father.

There was a significant relationship between problems with feeding and method of feeding at one month, $\underline{X}^2\ (1) = 4.78$, $\underline{p} < .029$; 73% of the women who were breastfeeding at one month reported problems related to feeding. However, no relationship was seen between method of feeding and problems at any other time period.

Maternal Attitudes

Breastfeeding was related to more positive attitude towards the impending labour and birth during pregnancy; fewer concerns regarding labour and birth after the birth; more confidence in caregiving and a more positive attitude towards lifestyle change at one week and one month of the mother. There was no relationship between breastfeeding and lifestyle changes at three, six and twelve months postpartum. Neither was there a relationship between illness of infant, or colic at one and three months.

Paternal Attitudes

The fathers of the breastfed babies had more confidence in caregiving at one month. This indicates the extent to which support from a husband/patner can contribute to the success of breastfeeding.

Infant Variables

Breastfeeding was unrelated to: infant temperament as measured by the Carey; the Bayley Scales of Infant Development; and the secure or anxious attachment categories of the Strange Situation.

Hospital

Analyses of the relationship between breastfeeding and, obstetric variables, illness of infant, postpartum problems were examined using Chi square. These analyses indicated that there was no relationship between breastfeeding and obstetric variables e.g. induction of labour, use of analgesics, use of anaesthesia, method of birth, fetal monitoring or complications.

It has been shown by Rousseau and associates (1982) that successful breastfeeding depends upon support of the health care professionals. Similar results were seen in this study in that the women who rated their hospital experience more positively breastfed for a longer period of time. The more satisfied the women were with their hospital experience (all subscales) the longer the mother breastfed. The less time the baby spent in the hospital, the longer the mother breastfed. Breastfeeding was unrelated to development of maternal feelings in hospital.

Early mother-infant contact (as reflected in method of birth) was not demonstrated as being a necessary prequisite for successful, long-term breastfeeding. This is consistent with the results of recent studies (Bradley, Ross, & Warnyca, Note 3; Gulick, 1982; Rousseau et al. 1982), but contradicts other recent research in which a significant relationship was found between method of birth and breastfeeding behavior (Boulton, 1982; Martin, 1978; Palmer et al. 1979; Ellis & Hewatt, Note 14).

Maternal Employment

There was a significant relationship between employment status and method of infant feeding at six and twelve months, $\underline{X}^2(2) = 21.69$, $\underline{p} <.0001$ and $\underline{X}^2(2) = 10.08$, $\underline{p} < .006$. respectively. At six months 82 (45%) of the women were breastfeeding; of these, 71% were not working, 24% were working part-time and 5% were working fulltime. Of the women who were both breast and bottle feeding, 54% were not working at six months; 35% were working part-time, and 11% full-time.

At twelve months 19% of the women were breastfeeding, and of these 73% were not working and 27% were working part-time. None of the working women was breastfeeding only at 12 months. Of those who were breast and bottle feeding, 45% were not working, 30% were working part-time and 25% working fulltime.

CHAPTER VI

LIFESTYLE PRACTICES DURING THE CHILDBEARING YEAR

This study afforded the opportunity to describe the lifestyle behaviours of the women as these behavours related to psychological functioning. The areas of interest were smoking, alcohol and maternal employment.

Smoking - Literature Review

A recent review of the literature concerned with smoking during pregnancy (Sidle, 1982; Wynn & Wynn, 1979) made little or no reference to maternal psychological functioning which may contribute to smoking behaviour. While a great deal of research has examined the association of smoking and decreased birthweight; incidence of preterm birth; increased perinatal mortality; little is known regarding the possible psychological reasons for smoking during pregnancy and the potential for intervention. This study allowed the investigation of relationships between cigarette consumption and such variables as level of anxiety and depression, as well as attitudes towards pregnancy and obstetric outcome.

Results

The percentage of women who smoked cigarettes during pregnancy and the postpartum period is outlined in Table 36, together with the mean number of cigarettes smoked daily by smoking women. It should be noted that smoking behaviours increased in the postpartum period.

There were no significant differences in psychological functioning between

TABLE 36

Frequency of Women Smoking
During the Childbearing Year and
Mean Number of Cigarettes Smoked Daily

	N	%	$\bar{X}$/day
Before pregnancy	265	28	-
Initial Interview	265	22	7.08
35 weeks	255	14	9.22
1 month	258	16.3	12.17
3 months	247	19	12.69
6 months	236	18	13.18
12 months	241	19	11.84

the smokers and non-smokers in the prenatal period. Women who have never smoked were compared on the personality subscales. Non-smokers were significantly higher on the subscale related to cognitive structure, $t(226) = -3.03$, $p <.003$. They described themselves as perfectionistic, seeking certainty, desiring to make decisions based on definite knowledge rather than probability. Smoking was not related to negative life events, stress or social support. Women who were smoking at three months reported significantly higher levels of stress and significantly less social support than the non-smokers, $t(241) = -2.09$, $p <.038$ and $t(240) = 2.00$, $p <.047$ respectively.

In the postpartum period, a comparison of smokers and non-smokers indicated that the only psychological variable which differentiated the two groups was their level of anxiety. The women who did not smoke were significantly more anxious than those who smoked at one month postpartum, $t(240) = -2.03$, $p <.043$, and at the twelve month follow-up, $t(219) = -2.95$, $p <.004$.

With respect to attitude questionnaires, there were no differences between the non-smoking and women who smoked in terms of their perceived levels of confidence in caregiving. At the follow-up time periods, the women who smoked had a significantly more positive attitude towards their lifestyle change than the non-smokers. See Table 37 for the means and standard deviations of these data.

TABLE 37

Means and Standard Deviations of Attitude Toward Change in Lifestyle of Smokers and Nonsmokers

	N	$\bar{X}$	SD	p
Smoking before pregnancy				
1 month change				
smokers	67	20.99	4.15	.043
nonsmokers	175	19.84	3.83	
Smoking prenatally				
1 month change				
smokers	55	21.09	4.22	.046
nonsmokers	187	19.88	3.83	
12 month change				
smokers	45	35.55	6.38	.040
nonsmokers	171	33.39	6.22	
Smoking at 1 month				
1 month change				
smokers	40	21.53	4.43	.022
nonsmokers	199	19.96	3.79	
Smoking at 12 months				
12 month change				
smokers	40	35.73	6.49	.028
nonsmokers	176	33.27	6.33	

3 and 6 month change scores are not significant

Alcohol - Literature Review

Research over the past few years has clearly demonstrated the harmful effects of maternal alcohol consumption on fetal development (Abel, 1980; Harlap & Shiono 1980; Newman & Correy, 1980; Streissguth, 1977).

Davidson, Alden & Davidson (Note 15) made the point that studies have not typically considered the postnatal drinking patterns of women. In their study, they found that many women were advised by medical personel to drink in order to reduce stress and to aid the "let down reflex" during breastfeeding. According to these authors, animal studies have indicated that (a) alcohol inhibits the "let down reflex" and (b) may interfere with nursing. Davidson et al. also pointed out that alcohol has been shown to enter the milkstream. They surveyed 189 women in their ninth month of pregnancy. It was found that of the sample who described themselves as non-drinkers in the prenatal period, 57% reported consuming alcohol during the postpartum period. In addition, a significant change was seen in situations under which drinking occurred. There was a significant increase in the number of women who stated that they drank because they were tired or needed to relax in the postpartum period, as opposed to drinking while celebrating, socialising or with their spouse in the prenatal period.

Results

The percentage of women who used alcohol during pregnancy, the level of alcohol, and the postpartum period is outlined in Table 38, together with the mean number of servings of alcohol ingested per week.

TABLE 38

Frequency of Women Using Alcohol During the Childbearing Year and Mean Number of Servings per Week*

	N	%	Servings /week $\overline{X}$
Before pregnancy	265	79	-
Initial Interview	265	66	1.58
35 weeks	254	50	1.88
1 month	257	76	3.48
3 months	245	79	3.52
6 months	234	81	3.37
12 months	239	76	3.84

* definition of 1 serving of alcohol = ½ ounce absolute alcohol
= 5 ounces wine
= 1 ounce spirit
= 12 ounces beer

It should be noted that the amount of alcohol consumed increased in the postpartum period.

The number of women who consumed alcohol at each time period are presented in Table 39. Of particular interest are the boxes outlined in darker ink, indicating the number of women who were consuming alcohol in the postpartum period who did not drink before they became pregnant.

Level of psychological functioning during pregnancy was unrelated to alcohol consumption during pregnancy but differences were seen following the birth of the baby. Those women who were drinking at the time of the Initial Interview were significantly more depressed than the non-drinkers after the birth of the baby, $\underline{t}(210) = -2.49$, $\underline{p} < .013$. The non-drinkers at the Initial Interview were significantly more anxious after being at home for one week than the drinkers, $\underline{t}(222) = -2.05$, $\underline{p} < .041$. There was no relationship to negative life events, stress, social support or trait anxiety.

A comparison of alcohol/nonalcohol users on the personality subscales revealed that women who used alcohol scored significantly higher on the subscale describing themselves as observant, sensuous, gaining enjoyment from physical sensations (Sentience), $\underline{t}(226) = 2.97$, $\underline{p} < .003$.

The use of alcohol before pregnancy related to significantly higher levels of confidence in caregiving at one month, $\underline{t}(239) = 3.60$, $\underline{p} < .001$. The use of alcohol during pregnancy was also related to significantly higher levels of confidence in caregiving at the one week and one month postpartum, $\underline{t}(226) = 2.56$, $\underline{p} < .011$ and $\underline{t}(239) = 3.43$, $\underline{p} < .001$.

TABLE 39

Contingency Table of Number of Consumers and Non Consumers of Alcohol at Each Time Point

Alcohol Consumer Before Pregnancy	Initial Interview		35 Weeks		1 Month		3 Months		6 Months		12 Months	
N = 265	N = 265		N = 254		N = 257		N = 245		N = 234		N = 239	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
YES	171	39	116	85	167	35	169	29	163	22	160	31
NO	5	50	11	42	28	27	23	24	26	23	20	28

Women who consumed alcohol during the postpartum period had significantly less positive attitudes towards the life changes brought about by the baby than the non-drinker. See Table 40 for the means and standard deviations for these data. This attitude change in the postpartum is intriguing - in a sense this confirms the findings of Davidson et al. (Note 15) who reported that the rationale given by their sample of women differed according to the time in the childbearing cycle that they were questionned about their drinking habits. These results merit further research.

Other Lifestyle Results

Drugs

Prescription drugs. Women were asked about use of prescription drugs. Less than 2% of women at six and twelve months were using mood elevators and less than 1% of the women were using tranquillizers at any time period. These data are outlined in Appendix T.

Over-the-counter. During their pregnancy approximately 18% of the women were consuming non-prescription drugs. In the postpartum, the percentage of women using OTC drugs ranged between 19% at one month to 10% at one year postpartum.

Maternal Employment

According to Schacter (1981) there is little known about the effect of maternal employment on children under three, although Schubert, Bradley-Johnson and Nuttall (1980) contend there are many articles suggesting that maternal employment has a negative effect on mother-child relationships. The present study allowed the opportunity to

TABLE 40

Means and Standard Deviations of Confidence in Caregiving and Attitude Toward Changes in Lifestyle of Drinkers and Nondrinkers *

	N	$\bar{X}$	SD	p
Drinkers before pregnancy				
1 month care concerns				
drinkers	190	30.95	5.89	.000
nondrinkers	51	27.63	5.67	
Prenatal drinkers				
1 week care concerns				
drinkers	150	36.33	6.57	.011
nondrinkers	78	33.88	7.36	
1 month care concerns				
drinkers	158	31.18	5.72	.001
nondrinkers	83	28.46	6.12	
Drinking at 1 month				
1 month change				
drinkers	182	19.76	3.99	.001
nondrinkers	57	21.70	3.42	
Drinking at 6 months				
6 month change				
drinkers	186	32.99	6.07	.009
nondrinkers	40	35.80	6.44	
Drinking at 12 months				
12 months change				
drinkers	164	33.14	6.22	.018
nondrinkers	52	35.56	6.75	

* 3 month change score was not significant

describe the association between maternal employment and infant development. The relationship between maternal employment and psychological functioning was investigated using analyses of variance for three groups, followed by Newman-Keuls procedure for multiple comparisons. The measures on which the three groups were compared included personality characteristics, stress, anxiety, depression, social support, mood, self-esteem, social adjustment, attitude towards change in lifestyle and the number of negative life events.

Six months. At this period, 56.4% (133) women were not employed outside the home; 25% (61) were working outside the home on a part-time basis and 17.8% (42) women were working full-time.

The women who were working fulltime were significantly more stressed, $F(2,233) = 3.66$, $p <.03$, and reported significantly more negative life events than the women who were not working, $F(2,228) = 3.76$, $p <.024$, but not more than those working part-time. There were no significant differences in personality characterisics or in levels of social support, depression, anxiety, mood, self-esteem, social adjustment or attitude regarding lifestyle change.

Chi square analyses revealed no association between maternal employment status and the following: maternal postpartum problems; smoking; use of alcohol; problems with infant feeding; illness of baby, infant temperament and the Strange Situation.

As mentioned earlier, infant feeding was significantly related to the working status of the mother, X^2 (4) = 27.82, p <.001. Of those mothers who were breastfeeding only, 70.7% were not working; 24% were working part-time; and 4.9% were working full-time. Of the women who were both breast and bottle feeding, 54% were not working at six months; 35% were working part-time, and 11% fulltime.

Twelve months. At this time point, 48.5% (117) women were not employed outside the home, 31% (75) were working part-time, and 20.3% (49) were working full-time. Women who were not working at 12 months scored significantly higher on the personality subscale of abasement than the working women (but not higher than those working part-time), F(2,210) = 3.179, p <.04.

Women who were working fulltime were significantly more stressed than the other two groups, F(2,238) = 4.16, p <.02. The level of social adjustment significantly differentiated women who were working part-time from the women who were not working or who worked fulltime, F(2,217) = 4.286, p <.01. Women who worked fulltime or who did not work at all had lower levels of social adjustment than the women who worked part-time.

There were no significant differences among the three groups of women on measures of stress related to the baby, social support, anxiety, depression, mood, self-esteem, negative life events, attitudes regarding lifestyle changes.

There were no significant differences in the cognitive and motor development of infants whose mothers worked when compared with non-working women. Nor was there an association between working status and the secure/anxious category of maternal-infant attachment as measured by the Strange Situation procedure.

At twelve months, chi square revealed no association between maternal employment status and postpartum problems, smoking, use of alcohol, illness of infant , or problems with infant feeding.

There was a significant relationship between working status and method of feeding at 12 months, $\underline{X}^2(2) = 10.08$, $\underline{p} < .007$. Of the women who were not working, 73% were breastfeeding; of the women who were working part-time 27% were breastfeeding; and no women who were working full-time were breastfeeding only. With respect to the combination of breast and bottle feeding: of the non-working women 45% were breast and bottle feeding; of the part-time workers 30%; of the full-time working women, 24% were combining methods of feeding.

It is apparent from the above that few differences were seen between working and non-working women. Working women were more stressed and had more negative life events than non-working women. Women who did not work and women who worked full-time had more difficulties in the area of social adjustment. Non-working women appear to think of themselves in a more subordinate way than working women, endorsing items which described them as self-belittling, resigned, self-critical, self-accusing.

The babies of the mothers of the three working groups did not differ significantly on the developmental measures, or in their attachment behaviours towards their mothers. These findings are consistent with a recent study that found communication patterns between the mother/infant dyad were not related to maternal employment status (Schubert et al. 1980).

As Oakley (1980) pointed out, being a homemaker carried the consequence of "loss of income, status, occupational identity and social interaction " (p. 232). As Miller & Sollie (1980) pointed out, the birth of a child occasions a certain amount of change in the lives of the family members; and while birth of a child is usually thought to be a positive event, some of the life changes may well be perceived as negative (e.g. there is greater financial expense, less time for self, and changes in sleeping patterns). Working part-time rather than fulltime or not at all, seems to be an alternative that offers less stress, more time to care for the baby and socialize with friends, and little loss of occupational identity or social interaction with peers.

CHAPTER VII

IMPLICATIONS

Nature of this Study

This study was a prospective, longitudinal study of the psychology of pregnancy and childbirth in a sample of normal primiparous women. The lack of empirical data and theoretical propositions in this area of research prevented a hypothesis testing approach and therefore a quasi-experimental approach was taken.

This was a natural field study (Runkel & McGrath, 1972) the nature of which resulted in uncontrolled sampling factors, e.g., self-selection of the participants, selection factors operating in the choice of hospital in which the women were to give birth, the method of birth, and a volunteer bias (Rosenthal, 1965). Moreover, the hospital and home visits conducted by the Nurse Interviewers were not part of the usual health care service for the childbearing family.

Methodological Improvements

One of the major strengths of this study was its prospective, longitudinal approach, allowing the psychological functioning of the men and women to be evaluated over the duration of the childbearing experience. This study was unique in terms of its sample size and homogeneity as well as the variety of measures utilized in the assessments. Inspection of Table 1 shows that the sample was reasonably representative of the population of the Canadian city from which it was drawn. The participants constituted a sample of healthy, well-educated middle class women and their husbands/partners living in a stable relationship and cannot necessarily be generalized to the high risk population. The homogeneity of the sample, however, decreases the possibility that the findings were confounded by extraneous variables such as parity, education for childbirth or socioeconomic status.

Standardized measures were used whenever possible. Some of the data that were obtained in this study were self-report measures and are therefore susceptible to reactive bias (Webb, Campbell, Schwartz, & Sechrest, 1966). Nevertheless, there are some advantages to the use of self-report; one obtains a more direct measure of individual feelings rather than interpretations. Another important advantage of self-report measures is that they are not as obtrusive as other techniques.

Psychological Functioning and Method of Birth

The first major finding of this study was that psychological functioning during pregnancy or birth was unrelated to method of birth. The second major finding was that pregnancy and childbirth was not seen to be a time of poor psychological health, anxiety or depression in this sample of healthy, well-educated women. These results contradict much of what is written in the lay and professional literature and the mass media, in which it is asserted that a difficult birth or separation from the baby will result in poor psychological health, parenting difficulties and so forth.

This study demonstrated that women adapt well to the stress of birth and parenthood. It also suggests that most healthy, prepared women would adapt well following the birth of their baby. Women need to be reassured that they can cope and that fairly soon after the birth of their baby they will be functioning in their usual manner.

Intervention

The high incidence of intervention in a well nourished, well-educated, prepared sample of women is of concern. It would seem that if women could approach birth in a more relaxed manner, allowing their bodies to labour in the way expected for a population such as this, then there may be fewer cesareans, forceps, episiotomies, and less use of analgesics and anaesthesia. The responses of the women who had cesarean and forceps birth indicated that the health professionals have a responsibility towards the labouring woman above that of physical care. By providing emotional and psychological care to the labouring woman the birth process can only be enhanced, even a difficult birth (Kitzinger, 1978a, Peterson, 1981). This is an area that warrants empirical investigation - there may be benefits not only for the mother but also to the health care system in terms of cost-efficiency.

Anxiety and Depression

The third major finding was that levels of anxiety and depression significantly differentiated the women and men on a variety of measures even though the sample was not clinically depressed.

At the inception of this research it had been anticipated that there would be a subsample of clinically depressed women which would have been large enough to compare with the non-depressed subsample but, as the data showed, this was not possible. Despite this, the comparisons of high and low levels of depression and anxiety did reveal significant differences. For example, women high on anxiety and depression: had more concerns regarding their pregnancy and birth, were less satisfied with their experience in hospital, were less confident in caring for their baby, were less positive regarding the lifestyle changes in the postpartum period, and had a less positive marital and social adjustment.

A fourth major finding, was that neither method of birth or level of psychological dysfunction reflect on infant development. The more negative aspects of psychological functioning impinged upon the level of functioning of the women but not upon their baby. This result is perhaps not unexpected given the recent studies of young infants and their dysfunctional mothers. As mentioned earlier, the women in this study had a great deal of support, attended prenatal classes, and were visited by the Nurse Interviewers. This may have prevented the development of early risk factors in the anxious and depressed women. One cannot assume though that this would be so for other more disadvantaged women. The relationship between depression and the disorders of mothering, therefore, remain to be empirically determined. This study found no association between maternal psychological functioning and infant development. There is a need for further research to clarify the relationship in the high risk population.

Need for Psychological Support

The present research indicates that anxiety and depression during and following pregnancy is maladaptive and that psychological intervention should be incorporated into the health care practices of the childbearing women. Traditionally, psychologists have not been involved in pregnancy and birth - usually seen as the jurisdiction of medicine and nursing - despite their recognised role in other health care and medical practises, i.e. behavioral medicine, health psychology (Masesk, Epstein, & Russo, 1981; Matarazzo, J.D., 1980).

It has been stated that it is not enough to rely on medical and hospital care to obtain the best perinatal health results (Bradley, et al. 1978). Even in psychologically well-adjusted women, there may be difficulties associated with nutrition, smoking, alcohol, diet, problems with diabetes, hypertension, compliance with medical regimes. All of these affect the health of the mother and fetus, and each has a psychological component to maintenance and to their amelioration (Davidson & Davidson, 1980; Millon, Green, & Meagher, 1982).

There are many aspects of health which involve personal responsibility, i.e.maintenance of weight, nutritional habits, smoking, and alcohol consumption. Pregnancy is an ideal opportunity to help women institute change in inappropriate lifestyles.

Although women in this study attended prenatal classes, a proportion of them continued to smoke and consume alchol (albeit in small quantities) during pregnancy and the postpartum. Moreover, a percentage of the non-drinkers started to use alcohol in the postpartum period. Those who were drinking in the postpartum had less positive attitudes towards their lifestyle changes than the non-drinkers. There are more effective means of stress management than using alcohol.

Thirteen percent of the women in the study were classed as 'at risk' by the Nurse Interviewers after the six month visit. That these women would not normally have been identified, suggests the importance of postpartum follow-up.

An aspect of birth not touched upon in this study is the issue of management of pain during labour and birth. Many women in this study had both analgesics and anaesthesia during the birth despite their attendance at childbirth classes. Education -for- Childbirth classes teach various techniques to reduce the pain of labour, but recent research (Beck & Siegal, 1980; Beck, Geden, Brouder, 1979; Beck, Siegel, Geden & Brouder, 1981) indicated that these techniques are not as effective as believed. An argument can be made for the teaching of psychological pain management techniques during the pregnancy period.

The current nature of prenatal care does not support the emotional needs of the healthy woman. To introduce psychological services requires time and money and a change in philosophy towards the concept of health care for the childbearing family. One way of ensuring that psychological input is available in maternity care is to develop and evaluate such services through a prevention oriented project.

To conclude, at this time there is a lack of provision for psychological services in the obstetric area relating to the promotion and maintenance of physical and psychological health during and subsequent to pregnancy and childbirth. Growing evidence suggests the importance of psychological factors in the etiology, diagnosis and treatment of physical illness. While advances in obstetrics and pediatrics have reduced maternal infant mortality and morbidity, the prevention and treatment of psychological dysfunction associated with childbearing is virtually non-existent. The childbearing period is a cricial intervention point in terms of prevention and promotion of psychological health and wellbeing for the family as a whole.

Kissick (1972) stated that health is an illusive concept, frustrating description; he likened the search for health to the search for the "Holy Grail". There is a convergence in the literature indicating that pregnancy, birth and subsequent parenthood should be the focus of sustained interdisciplinary research and intervention. The writer feels that we should stop searching for the illusive "Holy Grail", and start utilizing present knowledge attained from service and reseach. As Stallworthy (1972) stated, "Obstetrics is no longer an exercise in mechanics but an opportunity for practising preventive medicine at its best."

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THE UNIVERSITY OF BRITISH COLUMBIA
2075 Wesbrook Mall
VANCOUVER, BC CANADA

Department of Psychology

PROJECT PREPARE

INFORMED CONSENT - PARTICIPANTS:

I agree to participate in the study of pregnancy and parenting that is being conducted by the University of British Columbia with the cooperation of the Vancouver Health Department.

I understand

(1) that this is a research project, the nature of which has been explained to me;

(2) that my participation involves my cooperation in the completion of questionnaires throughout the duration of the study and in interviews with a member of the research team throughout the same period;

(3) that I may withdraw at any time during the study and that I will be informed of the overall results upon its completion if I remain a participant;

(4) that the proposed research in no way interferes with standard medical treatment or my rights as a patient.

I give my permission to the member of the research team

(a) to have access to the medical records of my self and my infant (when born);

(b) to contact my physician.

I agree to participate on the condition that all information will be held in the strictest confidence and that at no time will my name or that of my infant be used in the report.

Signed ______________________ Date ______________

Signed ______________________

Alpha Reliability Coefficients for the Full Scale Attitude Questionnaire

Attitude	N	# of items	Alpha
Attitude toward pregnancy			
mother	265	37	.85
father	239	37	.83
Attitude toward labor & birth			
mother	217	31	.83
Attitude toward baby			
Hospital			
mother	230	28	.83
1 Week			
mother	238	38	.87
father	193	38	.89
1 Month			
mother	244	33	.87
father	204	33	.90
3 Months			
mother	246	45	.89
father	208	45	.89
6 Months			
mother	238	45	.90
father	178	45	.88
12 Months			
mother	217	45	.91
father	171	45	.89

Prenatal

Alpha Reliability Coefficients*for the Revised Questionnaires on Pregnancy, Labor and Birth

		Pregnancy		Labor/Birth	
	N	# of items	Alpha	# of items	Alpha
Mother	256	8	.82	5	.74
Father	256	8	.79	5	.70

* Alpha levels depressed due to the limited number of items in the scales (Nunnally, 1978).

Prenatal

Scale Items

Concern with Labor and Birth

1. Most women go through labor without much difficulty.
2. I worry that I (my wife) will have (suffer) a great deal of pain during childbirth.
3. Any pregnant woman (a husband) dreads delivery (for his wife).
4. I frequently worry that my (our) baby might be injured during childbirth.
5. I frequently worry that I'll (my wife will) have a hard time during delivery.

Attitude to Pregnancy

1. Being pregnant makes me irritable. (I am more irritable during my wife's pregnancy.)
2. When I first found out I (my wife) was pregnant, I was delighted.
3. I have felt my (wife's) pregnancy to be long and tiresome.
4. I have been happy and cheerful during pregnancy. (I have been happier and more cheerful since I knew we were going to have a baby.)
5. I've been more short tempered since I've been pregnant. (My wife's pregnancy has made me more short tempered than I was before.)
6. Since becoming (my wife became) pregnant, I've never felt happier.
7. I've been energetic and excited during pregnancy (since I knew I was going to be a father).
8. I have enjoyed this pregnancy. (My wife's pregnancy has been a happy time for me.)

Postpartum
Alpha Reliability Coefficients for the Revised Questionnaires on Confidence in Care Giving and Attitude Toward Lifestyle Change

		Care Scale		Change Scale	
	N	# of items	Alpha	# of items	Alpha
1 Week					
mother	238	10	.72	7	.73
father	193	10	.77	7	.86
1 Month					
mother	244	8	.69	5	.75
father	204	8	.62	5	.78
3 Months					
mother	246	6	.64	9	.77
father	208	6	.47	9	.78
6 Months					
mother	238	6	.57	9	.75
father	178	6	.50	9	.75
12 Months					
mother	217	6	.57	9	.77
father	171	6	.50	9	.76

Postpartum

Scale Items

(1 = strongly agree, 6 = strongly disagree)

1 Week CARE

1. I feel unsure of myself in caring for the baby.
2. I rarely worry about how much clothing or fresh air the baby should have.
3. I need my husband's (my wife needs my) help in caring for the baby.
4. When the baby cries a great deal, I often worry as to what I am doing wrong.
5. I wish I had confidence in someone whom I could ask even my smallest, perhaps silly, questions about the baby.
6. I dream of terrible things happening to the baby.
7. I have many questions about little things in relation to caring for the baby.
8. If my husband (wife) had had more practice handling the baby in the hospital, he(she) would feel more confidence helping with the baby now.
9. I frequently wish someone would reassure me that I am caring for the baby as I should.
10. If I had had more practice caring for the baby in the hospital, I would feel more confident caring for him/her now.

1 Week CHANGE

1. I sometimes wonder what we ever did without this baby in the home.
2. The baby takes so much time that most of the time I haven't (my wife hasn't) been able to do my (her) housework.
3. I haven't had time to rest or relax since I (my wife and the baby) came home.
4. Being tied down with a baby is very frustrating to me.
5. Our baby has brought a deeper relationship to my husband (wife) and myself.
6. I enjoy my daily routine since having the baby.
7. I have little time for my husband (wife) now.

1 Month CARE

1. I have often wished we had some experienced person whom we could ask our questions concerning the baby.
2. I find it difficult to interpret the baby's cry.
3. I have never felt afraid I will lose my temper of the baby's crying.
4. I often worry whether our baby is getting the right about or right kind of food.
5. I am rarely concerned as to the amount of clothing or fresh air the baby should have.
6. When the baby cries a great deal, I often worry as to what we are doing wrong.
7. I wish the Public Health Nurse would visit to tell us if we are caring for the baby properly.
8. I don't worry about the problems we've had with the baby because I know he/she will outgrow them soon.

1 Month CHANGE

1. I have felt discouraged and in low spirits since the baby has been home.
2. Being tied down with the baby is frustrating to me.
3. Our baby has brought a deeper relationship to my husband (wife) and myself.
4. I miss my freedom since the baby came.
5. Since the baby came I enjoy our household.

3, 6, and 12 Month CARE

1. I think that caring for my baby is the most satisfying job I (my wife) could have.
2. When the baby cries a lot I worry about what I'm doing wrong.
3. A baby's crying gets on my nerves after a while.
4. Diapering and caring for a baby can get a woman down.
5. I've called the doctor or nurse to ask how to care for the baby.

3, 6, and 12 Month CHANGE

1. I miss my freedom since having the baby.
2. Since having the baby I've been concerned about what it's done to my (my wife's) appearance.
3. I haven't had time to rest or relax since I (the baby) came home from the hospital.
4. I'm unhappy and discouraged about the things I can't do since we had the baby.
5. I never seem to get caught up in my work since having the baby.
6. After having the baby at home I felt like going out for an evening without him/her: (1 = within 1 week, 6 = not yet)
7. After childbirth I (my wife) felt like my (her) old self again: (1 = not yet, 6 = within 1 week)
8. Taking care of a young baby keeps me from doing many things I would like to do.
9. Being tied down with the baby is frustrating to me.

HOSPITAL QUESTIONNAIRE

Subscales		α	N
Factor 1	Satisfaction with hospital experience	.91	15
Factor 2	Labour and birth	.85	15
Factor 3	Confidence concerning mothering role	.81	7
Factor 4	Preparation for mothering role	.82	8

Factor 1 Satisfaction with hospital experience

- received courteously at hospital
- people who work in hospital are courteous
- nurses made me feel everything all right
- strong feeling of trust in care I would receive
- was satisfied with help from case room staff
- can reach a nurse to ask her questions any time
- I did not like the nursing personnel
- I feel comfortable in this maternity unit
- I receive very little help from the nursing personnel
- not satisfied with experience on postpartum unit
- nursery nurse is very helpful
- I've been unhappy in the hospital
- have not received consistent teaching from the nurses
- I enjoyed my stay on the postpartum floor
- will have next baby in this hospital

Factor 2 Labour and delivery

- included in planning of our labour
- not given information I wanted about progress of birth
- discussed use of pain killers and anesthesia with doctor
- wishes about anesthetics were followed
- advantages and disadvantages of pain relievers explained
- unhappy with method of birth
- felt had control over birthing experience
- satisfied with nurses' explanation of progress during labour
- not satisfied with information during second stage of labour
- did not have enough help coping with contractions
- labour and delivery experience as expected
- nurses made me feel good about the way I coped with labour & delivery
- doctors made me feel good about the way I coped with labour & delivery
- experience made me afraid to go through it again
- phrase best describing your experience of birth

continued...

HOSPITAL QUESTIONNAIRE continued

Factor 3 Confidence concerning mothering role

- can generally tell what my baby needs
- know what to do to care for baby
- little self confidence regarding childcare
- do not feel confident about mothering role
- consider that I am a motherly person
- feel very close to baby
- adjustment from hospital to home will be easy

Factor 4 Preparation for mothering role

- can have baby whenever I want and return to nursery when I wish
- during hospital stay difficult to feel that baby mine
- received enough teaching about caring for baby in hospital
- hospital rules give freedom with baby
- hospital preparing for new mothering role
- in hospital gained experience in caring for baby
- satisfaction with caring for baby
- satisfaction with information regarding baby's behavior

HOSPITAL FOLLOWUP

Subscales		α	N
Factor 1	Satisfaction with hospital experience	.89	14
Factor 2	Confidence concerning mothering role	.89	12
Factor 3	Control over labour and birth	.83	7
Factor 4	Satisfaction with experience on post-partum unit	.87	11

Factor 1 Satisfaction with hospital experience

- I was admitted promptly when I arrived at the hospital
- my husband and I were received courteously
- people working in hospital are courteous
- nurses made me feel things would be all right
- strong feeling of trust in care at hospital
- satisfied with medical care during pregnancy
- husband made welcome on maternity unit
- satisfied with person who delivered baby
- not given information wanted regarding progress of birth
- nurses made me feel good about coping with labour and birth
- satisfied with nurses' explanations of progress during labour
- satisfaction over help from labour and delivery room staff
- I didn't like nursing personnel
- I felt comfortable in maternity unit

Factor 2 Confidence concerning mothering role

- don't feel confidence about mothering role
- when baby cries, I feel irritated
- consider self a motherly person
- feel close to baby
- adjustment from hospital to home was easy
- felt confident about caring for baby when first coming home
- can tell what baby needs
- know what to do to care for baby
- little self confidence in child care (now)
- little self confidence in child care (1 month)
- when first came home, felt worried about caring for baby
- now not worried about how to care for baby

continued ...

HOSPITAL FOLLOWUP

Factor 3 Control over labour and birth

- my labour and birth experience was as I expected
- felt had control over birthing experience
- my labour was as I expected
- my birth was as I expected
- how would you rate labour and birth (long-short?)
- how would you rate labour and birth (easy-difficult?)
- birthing experience made me afraid to go through it again

Factor 4 Satisfaction with experience on postpartum unit

- how satisfied with experience in postpartum unit?
- received enough rest in hospital
- received little help from nursing personnel
- not satisfied with experience on postpartum unit
- nursery nurses very helpful
- was unhappy in hospital
- received enough teaching about caring for baby in hospital
- did not receive consistent teaching from nurses
- hospital prepared me to adjust to mothering role
- looking back, how much help received from nursing personnel
- in hospital gained experience caring for baby

Appendix E

SOCIAL SUPPORT

1. Do you have someone to whom you can talk to about your pregnancy (baby)?	1. yes 2. no
2. Are you in personal contact with your immediate family?	1. yes 2. no
3. Are you in personal contact with your husband's family?	1. yes 2. no
4. Do you know most of your neighbours?	1. yes 2. no
5. Are they amoung your personal friends?	1. yes 2. no
6. Do you have any friends who are pregnant or recently had a baby?	1. yes 2. no
	Score = sum of items

STRESS

Are you under any stress at this time?

1. Health	1. yes 2. no
2. Economic	1. yes 2. no
3. Work	1. yes 2. no
4. Marital	1. yes 2. no
5. Family/friends	1. yes 2. no
6. Social	1. yes 2. no
7. Other	1. yes 2. no
	Score = sum of items

Appendix F

Means and Standard Deviations of Scores Obtained by Mothers & Fathers on Measures of Depression at Each Time Period

	N	$\overline{X}$	SD	Range	Std Score ≥ 70	%
DACL						
Initial Interview						
Mother	265	47.36	8.12	36-82	5	1.9
Father	243	46.34	7.07	33-80	2	0.8
35 Weeks						
Mother	254	47.29	7.90	37-84	3	1.2
Father	230	45.16	8.19	34-77	3	1.3
Hospital						
Mother only - Day 1	227	47.30	6.67	35-80	1	0.4
Day 2	227	48.59	8.00	34-85	5	2.2
Day 3	229	51.46	8.58	35-88	10	4.4
Day 4	214	52.92	9.45	33-90	13	6.1
Day 5	189	49.57	8.21	35-72	2	1.1
1 Week						
Mother	227	50.29	7.41	36-75	2	0.9
Father	197	45.49	7.07	33-80	1	0.5
1 Month						
Mother	254	47.52	7.56	37-86	2	0.8
Father	216	45.16	7.91	34-91	2	0.9
3 Months						
Mother	247	46.70	6.33	35-71	2	0.8
Father	204	45.35	7.32	32-70	1	0.5
6 Months						
Mother	240	48.90	7.52	34-79	4	1.7
Father	191	47.37	7.35	34-73	1	0.5
12 Months						
Mother	222	49.42	8.30	35-87	5	2.3
Father	175	49.00	7.52	35-74	2	1.1

Appendix G

Means and Standard Deviations of Scores Obtained by Mothers on Subsidiary Measures of Depression at Each Time Period

	N	$\bar{X}$	SD	Range	N	%
Beck Depression Index					≥ 14	
6 Months	151	4.90	4.53	1 - 23	9	6.0
12 Months	212	4.46	4.21	1 - 28	12	5.7
Depression Score					≥ 32	
3 Months	225	18.43	7.32	7 - 39	14	6.2
6 Months	235	18.16	7.96	7 - 40	17	7.2
12 Months	221	18.34	7.33	7 - 43	12	5.4

Appendix H

Means and Standard Deviations of Scores Obtained by Mothers & Fathers on Measures of Trait Anxiety & State Anxiety at Each Time Period

	N	$\overline{X}$	SD	Range
Initial Interview				
Trait Anxiety				
Mother	264	46.89	9.91	20-76
Father	241	45.33	9.49	20-69
State Anxiety				
Mother	264	44.59	10.44	20-76
Father	240	46.32	10.96	20-79
35 Weeks				
Mother	255	46.02	11.00	21-73
Father	229	45.33	11.28	20-72
Hospital				
Mother only	221	46.43	10.70	21-76
1 Week				
Mother	226	47.56	11.85	20-79
Father	193	45.58	11.37	20-73
1 Month				
Mother	255	43.97	11.65	20-74
Father	216	44.54	11.76	20-79
3 Months				
Mother	246	43.00	11.77	20-73
Father	205	45.95	11.85	20-79
6 Months				
Mother	240	44.24	11.14	20-74
Father	188	46.38	11.52	20-77
12 Months				
Mother	222	44.76	12.03	20-76
Father	174	46.55	11.11	20-70

Appendix I

Means and Standard Deviations of Scores Obtained by Mothers & Fathers on Measures of Mood at Each Time Period

	Mother		Father	
	$\bar{X}$	SD	$\bar{X}$	SD
Initial Interview	N = 224		N = 202	
Pleasure	2.13	1.41	1.99	1.14
Arousal	-0.38	1.01	-0.03	0.93
Dominance	0.38	0.96	1.08	1.06
Excitement	1.41	1.37	1.40	1.14
Stress	-1.87	1.51	-1.73	1.31
35 Weeks	N = 258		N = 228	
Pleasure	2.09	1.29	1.96	1.25
Arousal	-0.49	1.00	-0.04	0.93
Dominance	0.30	0.90	0.97	1.09
Excitement	1.44	1.32	1.43	1.30
Stress	-1.81	1.34	-1.58	1.43
Hospital	N = 215			
Pleasure	2.42	1.35		
Arousal	-0.18	1.01		
Dominance	0.11	1.07		
Excitement	1.89	1.43		
Stress	-1.69	1.93		
1 Week	N = 217		N = 190	
Pleasure	2.10	1.40	2.15	1.26
Arousal	-0.45	0.93	0.14	0.93
Dominance	0.17	1.03	1.10	1.11
Excitement	1.29	1.49	1.69	1.33
Stress	-1.54	1.62	-1.59	1.38
1 Month	N = 249		N = 213	
Pleasure	2.24	1.32	2.13	1.26
Arousal	-0.40	0.83	-0.12	0.92
Dominance	0.40	1.01	1.09	1.17
Excitement	1.47	1.35	1.69	1.31
Stress	-1.76	1.55	-1.70	1.46

continued ...

Measures of Mood at Each Time Period continued

	Mother		Father	
	$\overline{X}$	SD	$\overline{X}$	SD
3 Months	N = 232		N = 194	
Pleasure	2.19	1.22	1.83	1.20
Arousal	-0.27	0.95	0.05	0.88
Dominance	0.58	1.01	0.97	1.05
Excitement	1.58	1.29	1.44	1.21
Stress	-1.87	1.42	-1.42	1.33
6 Months	N = 241		N = 190	
Pleasure	2.02	1.38	1.76	1.28
Arousal	-0.37	0.90	-0.10	0.96
Dominance	0.62	0.98	0.97	1.06
Excitement	1.36	1.34	1.23	1.38
Stress	-1.76	1.43	-1.38	1.46
12 Months	N = 221		N = 171	
Pleasure	1.98	1.46	1.84	1.21
Arousal	-0.30	1.06	-0.02	1.02
Dominance	0.63	1.04	1.10	1.02
Excitement	1.33	1.39	1.37	1.26
Stress	-1.67	1.58	-1.46	1.37

Appendix J

Means and Standard Deviations of Scores Obtained by Mothers on Measures of Self Esteem, Social Adjustment, and Mother & Father Marital Adjustment

	N	$\bar{X}$	SD
Social Adjustment			
Prenatal/Initial Interview	264	1.73	.29
3 Months	245	1.85	.31
6 Months	233	1.76	.29
12 Months	221	1.80	.32
Self Esteem			
Prenatal/35 Weeks	253	3.91	.78
1 Month	248	4.16	.63
3 Months	243	4.26	.51
6 Months	233	4.23	.54
12 Months	213	4.03	.76
Marital Adjustment			
Prenatal/35 Weeks			
Mother	182	118.87	12.29
Father	165	115.99	12.17
3 Months			
Mother	238	117.82	13.21
Father	201	115.75	12.21
12 Months			
Mother	206	114.57	13.97
Father	169	114.36	12.16

continued ...

Means and Standard Deviations of Scores
Obtained by Mothers on Measures of
Social Support and Stress

	N	$\bar{X}$	SD
Social Support *			
Initial Interview	265	8.21	1.29
1 Month	255	7.89	1.30
3 Month	244	7.59	1.27
6 Month	236	7.52	1.26
12 Months	239	7.07	1.17

* low score more social support

	N	$\bar{X}$	SD
Stress *			
Initial Interview	265	12.77	1.19
35 Week	254	13.15	0.96
1 Month	257	12.84	1.30
3 Months	245	12.85	1.33
6 Months	236	12.71	1.32
12 Months	241	12.62	1.26

* low score less stress

Appendix K

Means and Standard Deviations of Scores Obtained on the Attitude Questionnaires

		N	$\bar{X}$	SD
Initial Interview				
Attitude to Pregnancy	Mother	263	157.16	19.33
	Father	236	154.82	16.34
Parent Satisfaction		251	145.75	20.71
Hospital				
Attitude toward Labour/Birth		217	138.13	13.14
Attitude to Baby		230	125.50	13.66
Hospital Questionnaire		223		
-satisfaction with hospital experience			71.02	11.21
-labor and birth			64.57	11.61
-confidence concerning mothering role			29.87	5.54
-preparation for mothering role			34.07	6.08
1 Week				
Attitude to Baby	Mother	227	157.89	17.89
	Father	192	159.97	18.20
1 Month				
Attitude to Baby	Mother	253	145.94	16.25
	Father	216	150.46	20.19
Hospital Followup		236		
-satisfaction with hospital experience			46.11	8.92
-confidence concerning mothering role			67.88	9.37
-control over labor and birth			22.89	6.95
-satisfaction with experience on postpartum unit			52.74	9.16
3 Months				
Attitude to Baby	Mother	245	197.94	20.32
	Father	206	196.18	22.31
6 Months				
Attitude to Baby	Mother	240	198.36	19.77
	Father	188	193.72	21.21
Adjustment to Fatherhood (Father)		102	155.77	16.87
12 Months				
Attitude to Baby	Mother	218	198.44	21.14
	Father	172	199.82	19.87

Appendix L

Means and Standard Deviations of Scores Obtained by Mothers & Fathers on Revised Subscales

	N	$\overline{X}$	SD
Concerns re: pregnancy			
mother	249	33.37	6.58
father	236	34.70	5.70
Concerns re: labour & birth			
mother	249	17.53	4.59
father	236	17.25	4.20
Feelings re: labour & birth			
mother	217	20.42	5.27
1 Week - caregiving			
mother	230	35.51	6.92
father	192	38.06	6.77
1 Week - change			
mother	230	26.64	5.26
father	191	27.31	4.85
1 Month - care			
mother	243	30.23	5.98
father	204	31.92	5.92
1 Month - change			
mother	243	20.17	3.95
father	204	22.53	4.40
3 Month - change			
mother	243	33.07	6.60
father	206	37.64	7.33
6 Month - change			
mother	236	33.40	6.14
father	177	36.05	6.54
12 Month - change			
mother	217	33.75	6.42
father	171	37.05	6.59

Appendix M

Means and Standard Deviations of Scores of Mother and Father on the Life Events Scale

	Mother		Father	
	$\bar{X}$	SD	$\bar{X}$	SD
Initial Interview	N = 242		N = 139	
Positive Life Events	2.13	1.60	1.93	1.54
Negative Life Events	0.85	1.34	0.78	1.27
1 Month	N = 255		N = 210	
Positive Life Events	3.18	1.88	3.27	2.04
Negative Life Events	1.04	1.48	0.77	1.32
6 Months	N = 240		N = 186	
Positive Life Events	1.18	1.27	1.42	1.52
Negative Life Events	0.80	1.32	0.57	1.11
12 Months	N = 221		N = 173	
Positive Life Events	1.15	1.44	1.35	1.50
Negative Life Events	0.92	1.35	0.68	1.07

Appendix N : 1

Obstetric Variables According to Type of Birth

Information Obtained from Medical Records in City of Vancouver Hospitals

	N	$\bar{X}$	SD
Length of gestation	252	39.84	1.66
Length of labor for vaginal			
1st stage (hours)	211	10.26	5.97
2nd stage (minutes)	204	70.23	39.68
total length (hours)	206	11.37	5.99
Number of days in hospital			
overall	250	6.14	4.34
$\leq$ 11	245	5.60	
$\geq$ 22	5	33.00	

Induction of labor N = 251

60.2% no

39.8% yes

- 62% cesarean
- 47% forceps
- 26% spontaneous

Fetal monitoring N = 242

55.0% none

45.0% fetal monitoring

- 9.9% internal
- 13.2% external
- 21.9% both

Use of fetal monitors & type of birth

83%	cesarean
50%	forceps
27%	spontaneous

continued ...

Appendix N : 2

Obstetric Variables According to Type of Birth

Type of birth *	N	% of total	% of type of birth
N = 260			
Vaginal	209	80.4%	
spontaneous	109	41.9	52.2%
forceps	100	38.5	47.9
Cesarean	51	19.6	
non-elective	44	16.9	86.3
elective	7	2.7	13.7

	Vaginal						
	Spontaneous		Forceps		Cesarean		
	N	%	N	%	N	%	% of total
Intact Perineum	N = 97		N = 95		N = 40		N = 232
Intact	2	2.1	2	2.1	39	97.5	18.5
Episiotomy	81	83.5	83	87.4	1	2.5	71.1
Tear 1st & 2nd degree	12	12.4	3	3.2	-	-	6.5
Tear 3rd & 4th degree	2	2.1	5	5.3	-	-	3.0
Tear anal	-	-	2	2.1	-	-	0.9

* 5% did not give birth in the three City of Vancouver hospitals. Information obtained by Nurse Interviewers.

continued ...

Appendix N : 3

Obstetric Variables According to Type of Birth

	Vaginal N = 199				Cesarean N = 49				
	Spontaneous N = 100		Forceps N = 99		Nonelective N = 42		Elective N = 7		N = 247
	N	%	N	%	N	%	N	%	% of total
Primary analgesia *									
none	52	52.0	32	32.3	11	26.8	5	71.4	40.5
nitrous oxide	2	2.0	-	-	-	-	-	-	0.8
Demoral	15	15.0	17	17.2	5	12.2	-	-	15.0
Nisentil	13	13.0	18	18.2	7	17.1	-	-	15.4
barbiturates	-	-	1	1.0	2	4.9	-	-	1.2
continuous epidural	18	18.0	31	31.3	16	39.0	2	28.6	27.1
missing data	-	-	-	-	1		-	-	
Anesthetic *									
none	5	5.0	3	3.0	-	-	-	-	3.2
general	-	-	2	2.0	19	40.5	3	42.9	9.7
spinal	1	1.0	1	1.0	-	-	-	-	0.8
epidural	32	32.0	83	83.8	23	54.8	4	57.1	57.4
pudendal	3	3.0	7	7.1	-	-	-	-	4.0
local	58	58.0	2	2.0	-	-	-	-	24.2
nitrous oxide	-	-	1	1.0	-	-	-	-	0.4
other	1	1.0	-	-	-	-	-	-	0.4

* 5% did not give birth in the three City of Vancouver hospitals.

continued ...

Appendix N : 4

Obstetric Variables According to Type of Birth

	Vaginal N = 199				Cesarean N = 49				
	Spontaneous N = 100		Forceps N = 99		Nonelective N = 42		Elective N = 7		N = 248
	N	%	N	%	N	%	N	%	% of total
Complications *									
none	72	72.0	25	25.0	-	-	-	-	39.1
2nd stage delay ≥ 2	12	12.0	31	31.3	-	-	-	-	17.3
fetal distress	2	2.0	9	9.1	7	16.7	-	-	7.4
CPD/mal-presentation	2	2.0	12	12.1	17	40.5	6	85.7	14.9
uterine inertia	-	-	7	7.1	13	31.0	-	-	8.1
antepartum haemorrhage	-	-	-	-	-	-	1	14.3	0.4
medical reasons	1	1.0	1	1.0	-	-	-	-	0.8
prolonged labor ≥ 24	2	2.0	6	6.1	1	2.4	-	-	3.6
prolonged ≥ 24 rupture/membranes	6	6.0	7	7.1	3	7.1	-	-	6.4
other	3	3.0	1	1.0	1	2.4	-	-	2.0

* 5% did not give birth in the three City of Vancouver hospitals.

Appendix O

Variables Relating to the Birth of the Infant

Gender N = 267

53.4%	male
46.6%	female

Apgar N = 250

	$\overline{X}$	SD
1 minute	7.93	1.70
5 minutes	9.21	0.91

Birthweight

N = 261
X = 3496.03 grams
SD = 539.91 grams

%	N	
3.8	10	below 2500 gm
14.6	38	2501 - 3000
30.7	80	3001 - 3500
34.8	91	3501 - 4000
14.5	38	4001 - 4500
1.2	3	4501 - 5000
.4	1	5001 - 5500

Type of Nursery N = 251

58.6%	regular
10.8	Transitional
30.7	Intensive Care

Reasons for Intensive Care & Transitional Nurseries N = 246

18.7%	cesarean
3.7	premature
1.2	small for dates
5.3	respiratory problems
12.6	observation
1.2	other
57.3	not applicable

Appendix P

Mother's Scores for 25th and 75th Percentile Cut Off Points (CP), Means and Standard Deviations for Anxiety and Depression

	Low Anxiety			High Anxiety				Low Depression			High Depression			
Time Points	CP	$\bar{X}$	SD	CP	$\bar{X}$	SD		CP	$\bar{X}$	SD	CP	$\bar{X}$	SD	
Initial Interview	<37	30.76	4.55	≥53	57.67	4.80		<41	38.51	2.79	≥52	57.84	6.68	
							1.2% *							6.0% *
35 Weeks	≤37	31.25	5.05	≥54	59.81	4.67		≤40	38.57	1.33	≥52	58.49	6.10	
							6.5							6.8
Hospital	≤39	33.23	5.34	≥54	59.47	5.24		≤46	42.90	3.32	≥57	62.85	5.77	
							5.3							10.9
1 Week	≤39	32.54	5.15	≥55	69.93	6.40		≤45	41.71	2.73	≥56	60.56	4.46	
							5.9							9.0
1 Month	≤35	29.49	5.03	≥53	58.57	5.15		≤42	39.10	1.83	≥52	57.34	5.74	
							6.6							9.6
3 Months	≤35	29.01	4.90	≥52	57.63	4.90		≤42	38.64	2.28	≥50	54.46	5.42	
							8.5							6.8
6 Months	≤39	31.52	6.26	≥53	57.78	4.61		≤42	39.80	2.62	≥53	59.29	5.91	
							5.1							6.0
12 Months	≤37	29.62	4.91	≥54	60.40	5.98		≤43	40.19	2.64	≥54	69.58	7.74	

$p < .001$ for all comparisons

* The percentage of people who changed from low to high (or vice versa) from one time point to the next.

Infant Assessment

Carey Infant Temperament Frequencies of Infants Within Each Category

N = 233

Difficult	12.4%
Intermediate High	13.3
Intermediate Low	33.5
Slow to Warm Up	4.7
Easy	36.1

Bayley Scales of Infant Development at 1 Year

N = 234

Mental Developmental Quotient

$\overline{X} = 112.58$ SD = 13.36

Motor Developmental Quotient

$\overline{X} = 104.58$ SD = 14.98

Strange Situation: Attachment Classification of the Infants

N = 212

		N	%
Anxious/avoidant	A1	11	5.2%
	A2	16	7.5
Secure	B1	14	6.6
	B2	44	20.8
	B3	40	18.9
	B4	28	13.2
Anxious/resistant	C1	26	12.3
	C2	24	11.3
Unclassified		9	4.2

Means and Standard Deviations Bayley Scales
Of Infant Mental and Motor Development
Assessed at One Year

	Low		High		
	$\bar{X}$	SD	$\bar{X}$	SD	p
Anxiety	N = 58		N = 50		
Mental	114.61	14.11	113.64	13.44	NS
Motor	104.55	16.14	103.60	13.10	NS
Depression	N = 49		N = 59		
Mental	113.37	13.43	110.36	12.53	NS
Motor	101.94	13.70	104.28	14.77	NS

Appendix S

Problems Experienced in the Postpartum Period As Reported to Nurse Interviewers

	1 Month N = 255		3 Months N = 246		6 Months N = 236		12 Months N = 241	
	N	%	N	%	N	%	N	%
No problems	157	61.6	159	64.6	166	70.3	167	69.3
Medical	55	21.6	43	17.5	34	14.4	11	4.6
Parenting	5	2.0	3	1.2	3	1.3	8	3.3
Financial	3	1.2	5	2.0	4	1.7	16	6.6
Emotional	23	9.0	17	6.9	14	5.9	11	4.6
Marital	4	1.6	6	2.4	5	2.1	8	3.3
Babysitting	2	0.8	3	1.2	5	2.1	6	2.5
Weight	6	2.4	-	-	-	-	4	1.7
Other problems			10	4.1	5	2.1	10	4.1

	Initial Interview N = 265		35 Weeks N = 254		1 Month N = 255		3 Months N = 247		6 Months N = 235		12 Months N = 241	
	N	%	N	%	N	%	N	%	N	%	N	%
Prescription drugs												
Elevators	none		none		none		4	1.6	none		4	1.7
Tranquilizers	2	0.8	1	0.4	none		2	0.8	2	0.7	1	0.4

Appendix T

Nurse Interviewers' Assessment of Risk

	N	%
Risk		
No risk	200	84.7
Questionable risk	25	10.6
At risk	11	4.7
In what way		
Not applicable	200	84.7
Wife abuse	1	.4
Sick baby	1	.4
Emotional problems	14	5.9
Physical health problems	1	.4
Baby has physical problems	1	.4
Parenting concerns	2	.8
Mother limited social support	3	1.3
Lack of available assistance regarding childcare	1	.4
Very young mother	4	1.7
Marital/Family stress	7	3.0
No specified	1	.4
Intervention		
No	205	86.9
Yes	31	13.1
Type of Intervention		
Put mother in touch with appropriate resource	15	6.4
Acted as a social support	11	4.7
Provided professional counselling	5	2.1

Appendix U

Fathers' Scores for 25th and 75th Percentile Cut Off Points (CP), Means and Standard Deviations for Anxiety and Depression

	Low Anxiety			High Anxiety				Low Depression			High Depression			
Time Points	CP	$\bar{X}$	SD	CP	$\bar{X}$	SD		CP	$\bar{X}$	SD	CP	$\bar{X}$	SD	
Initial Interview	≤40	33.30	7.01	≥52	58.04	5.75		≤41	38.28	2.63	≥49	53.20	5.63	
							7.0%							6.0%
35 Weeks	≤40	30.68	7.28	≥52	57.42	5.09		≤38	36.07	1.61	≥50	55.66	5.98	
							3.0%							4.0%
1 Week	≤39	29.98	5.64	≥52	57.76	5.15		≤39	36.75	2.13	≥49	53.15	4.92	
							3.0%							3.0%
1 Month	≤39	28.57	6.51	≥52	57.91	6.05		≤38	36.41	1.59	≥48	53.35	6.97	
							4.0%							5.0%
3 Months	≤40	31.19	6.68	≥52	69.12	6.41		≤40	36.89	2.81	≥49	53.22	5.45	
							6.0%							6.3%
6 Months	≤40	32.23	6.59	≥54	60.47	5.89		≤42	39.41	2.62	≥51	55.88	5.11	
							2.0%							7.0%
12 Months	≤40	31.70	6.48	≥53	69.29	5.32		≤42	39.93	2.47	≥54	57.82	4.78	

* $p < .001$ for all comparisons